

AUTOMATION in a sand and gravel plant
see page 76

Rock Products

THE INDUSTRY'S RECOGNIZED AUTHORITY

JULY 1957



Zoning . . .

It's the industry's biggest problem so you'll want to read this timely article on how you can secure better zoning regulations for your company

see page 66



A desert beckoned . . .

Ever thought of building a cement plant in the middle of a desert? One company not only thought about it but went ahead and did just that

see page 70

WILLIAMS ROLLER MILLS

• **Quality Fine Grinding...**
20 Mesh To 400 Mesh...
Micron Sizes On Some
Materials

EXCLUSIVE GEARLESS AND SPUR GEAR DRIVES

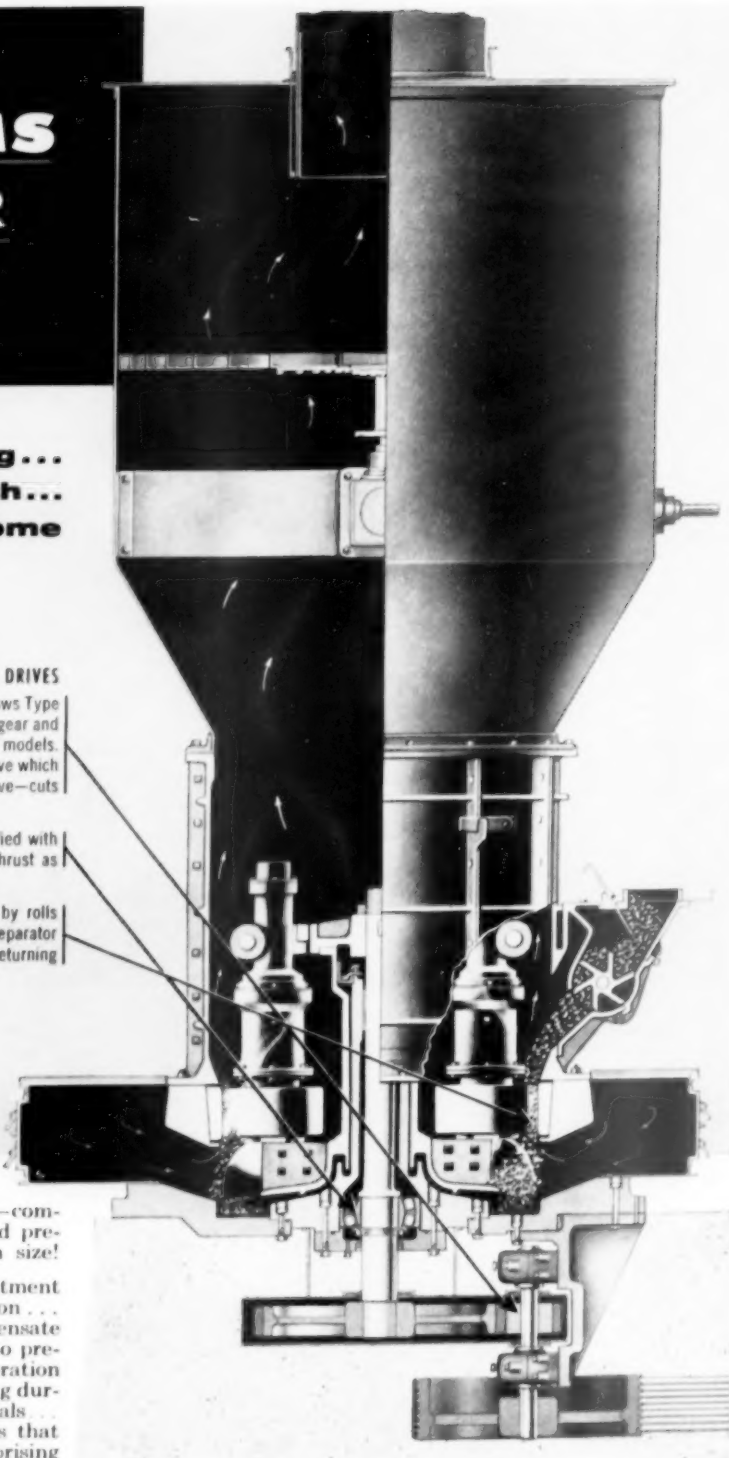
Another Williams advancement! Cutaway shows Type D Mill with Spinner Air Separator with spur gear and pinion drive used on Standard and larger models. Smaller sizes have simple gearless V-belt drive which is easier to maintain than bevel gear drive—cuts labor and downtime.

Bearing alignment of central shaft is simplified with only 2 bearings, the bottom one carrying thrust as well as radial load.

NOTE FLOW OF MATERIAL being ground by rolls rotating against bull ring, then air-swept to separator which discharges finished product while returning coarse tailings for regrinding.

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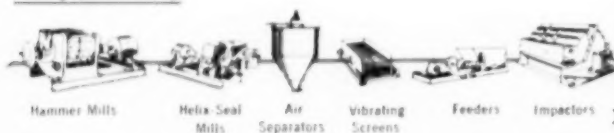
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FEATURES

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- The desert beckoned and a new plant was built** ● W. B. Lenhart 70
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B.F. Goodrich report:

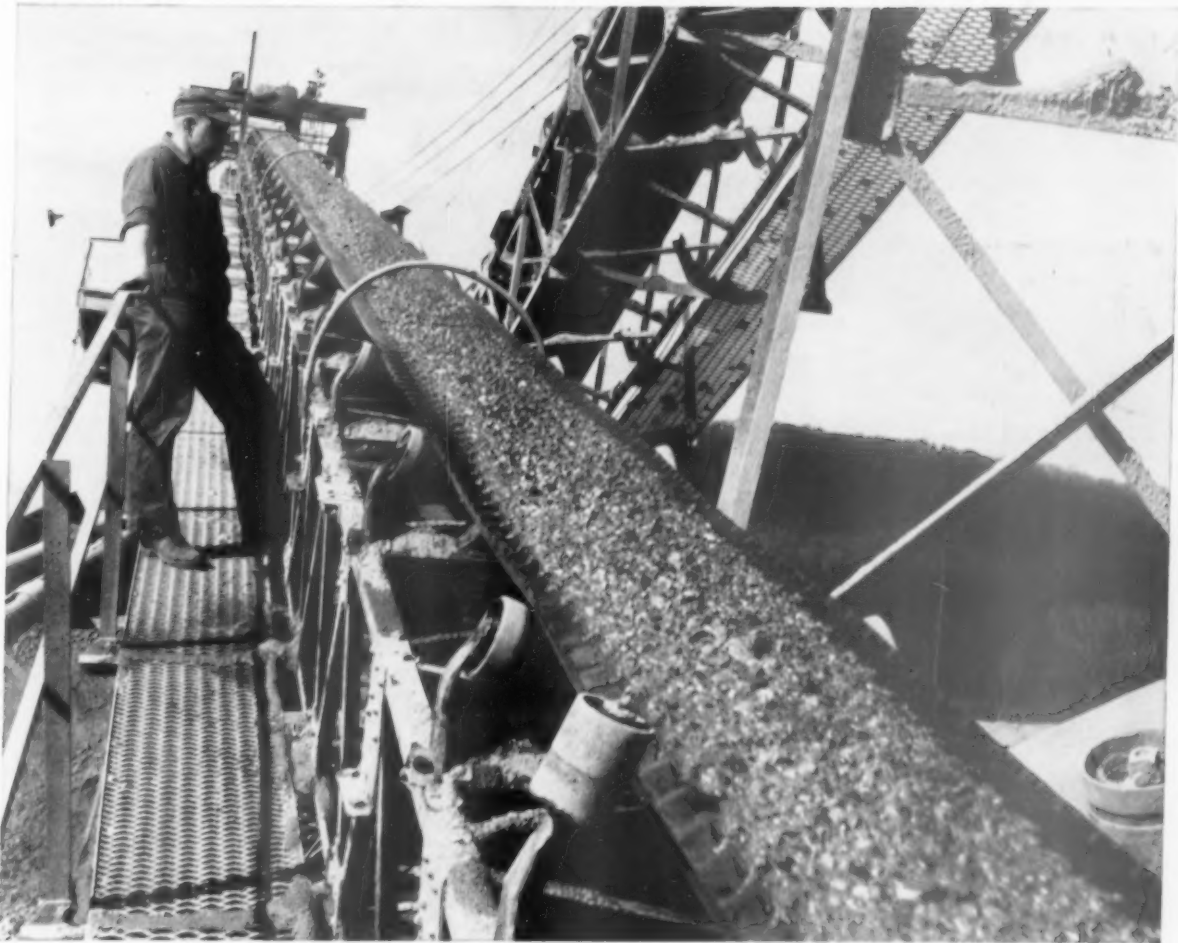


Photo courtesy Basic Construction Materials Division, Chillicothe, Ohio

Rocks used to slide down faster than they went up

B. F. Goodrich improvements in rubber brought extra savings

Problem: Getting tons of sopping wet rock and gravel up that steep incline was causing plenty of trouble at this plant. When a regular conveyor belt was used, the wet gravel often washed down faster than the moving belt could carry it up.

What was done: Then a B.F. Goodrich man told the company about a special kind of belt, developed by B.F. Goodrich, to handle wet materials. This "Rifle Grip" belt, as it is called, is made with a series of extra-tough rubber ridges molded into the cover. The tread that these ridges form holds the

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Extra benefits: Another important feature is that just by using different angles of incline and troughing idlers, this same belt can carry such sloppy materials as wet mixed concrete and keep the water from draining away.

Where to buy: Your B.F. Goodrich

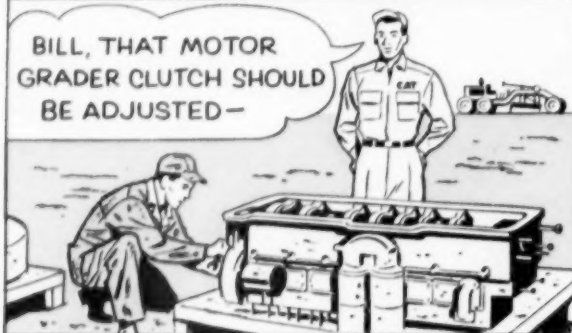
distributor has exact specifications for the B.F. Goodrich conveyor belt described here. And, as a factory-trained specialist in rubber products, he can answer your questions about all the rubber products B.F. Goodrich makes for industry. B.F. Goodrich Industrial Products Co., Dept. M-996, Akron 18, O.

B.F. Goodrich
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THE CASE OF THE SLIPPING MAINTENANCE PROGRAM

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GRADER CLUTCH SHOULD
BE ADJUSTED—



—AND WE HAVE SPECIALIZED REPAIR
BAYS WHERE WE CAN REALLY
DO A COMPLETE JOB! DO IT
QUICK, TOO.



LET'S GIVE IT A
TRY. WE'LL SEND
OUR BIG REPAIRS
IN TO YOU CHAPS!

AND, MY MAINTENANCE PROGRAM
IS DEFINITELY WORKING SINCE
YOU TOOK OVER THE TIME -
CONSUMING REPAIR WORK... WE
ALSO HAVE FEWER MAJOR REPAIRS
NOW.



GOOD! SAY,
HOW ABOUT
ATTENDING ONE
OF OUR FUTURE
CAT CARE
SCHOOLS?

I KNOW, BUT I'M
MUCH TOO BUSY!
OURS IS A BIG
OPERATION, YOU KNOW.



CAN WE HELP? WE
COULD HANDLE YOUR
MAJOR RECONDITION-
ING JOBS, THEN
YOU'LL HAVE MORE
TIME FOR MAINTENANCE.
WHY NOT TALK TO
THE BOSS?

SOME DAYS LATER

THERE! THIS ONE'S READY
TO ROLL AGAIN. WE'RE
CERTAINLY KEEPING AHEAD OF
MAINTENANCE AROUND
HERE THESE DAYS!



LET'S CHECK
ON MACHINE
NO. 17. THE
OPERATOR
REPORTED A
LEAKY PUMP—

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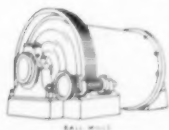
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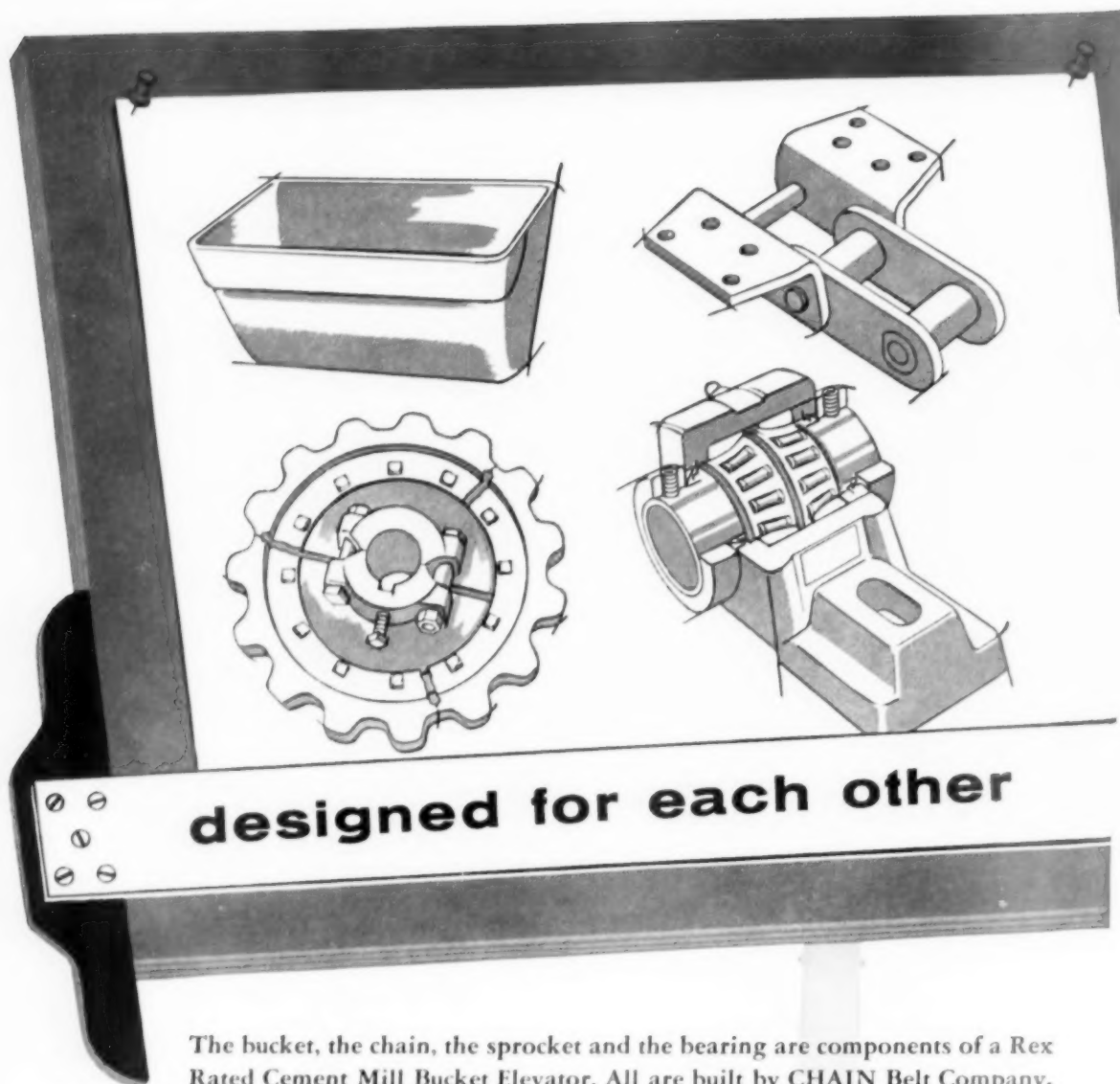
JAW CRUSHERS



SECONDARY GYRATORY CRUSHERS

ROCK PRODUCTS, July, 1957

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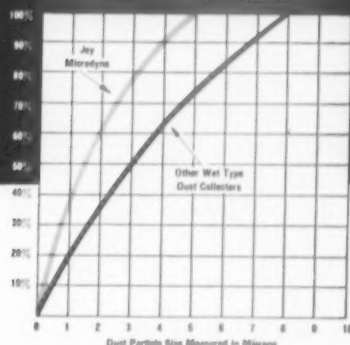
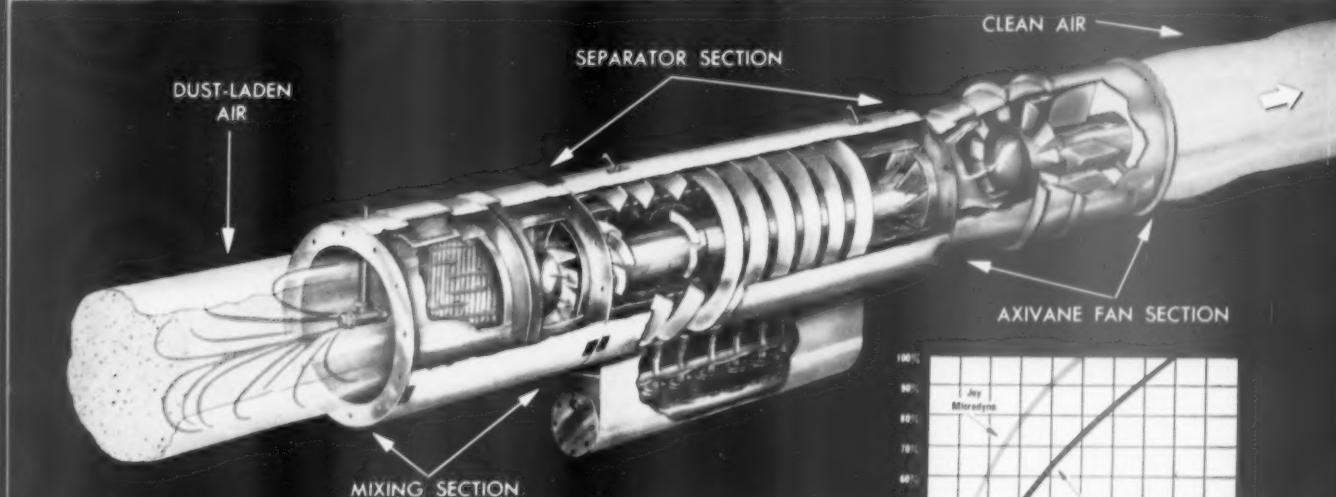
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Milwaukee 1, Wisconsin

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THE COMPACT, HIGH EFFICIENCY

JOY MICRODYNE DUST COLLECTOR



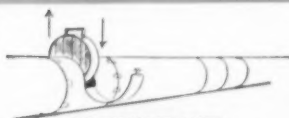
**CAN BE INSTALLED
WHERE NO OTHER
DUST COLLECTOR
COULD FIT**

Fits into existing ductwork,
often right at point of use.



**CLEANS 2500 to 64000
CUBIC FEET EACH MINUTE**

There is a Joy Microdyne model
designed to meet the special
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**LOW MAINTENANCE
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Get this descriptive bulletin or let a Joy Engineer take dust samples at your job site for plant analysis.

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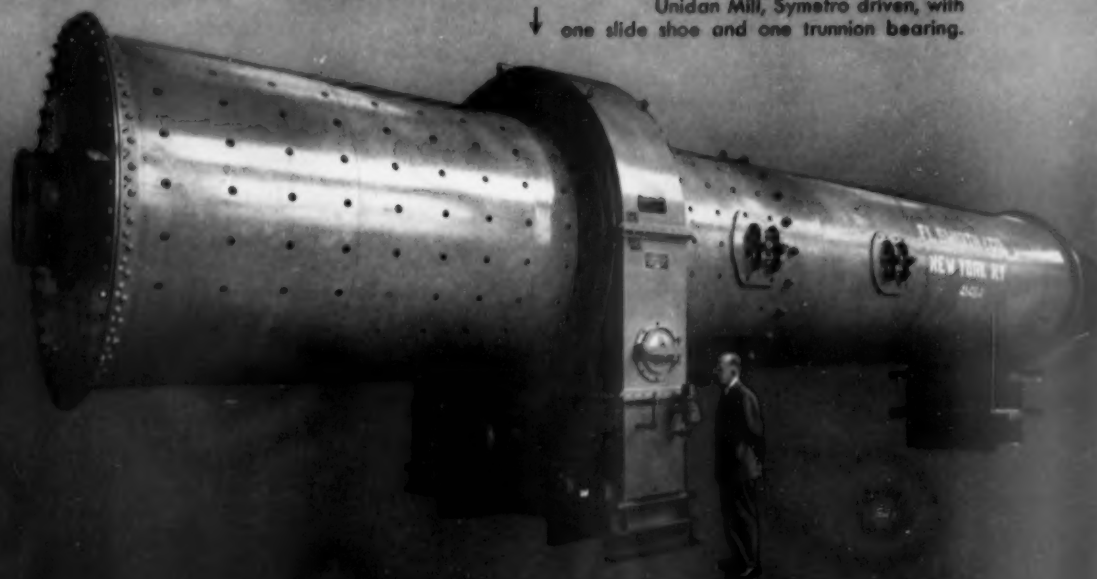


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What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

July, 1957

Construction spending in April reached another peak, as charted by U. S. Departments of Commerce and Labor. New construction put in place was valued at \$3.5 billion, comparing with \$3.4 billion in April 1956. Privately financed construction accounted for \$2.4 billion of the April 1957 total. In the first four months of this year, \$12.5 billion was spent on new construction, up two percent from the like 1956 period. The gain over last year is due to publicly financed construction, as private spending has declined.

After a somewhat slow start, the Federal road program is beginning to accelerate. Little more than 200 miles of the 41,000 mile network will be in place by midsummer, but construction contracts to build 1,123 miles of highways have been awarded. In work completed, Texas is the leader so far, and Illinois ranks second. **Wall Street Journal** reports that highway officials expect 8,000 miles of highways to be finished by 1961, after which 3,000 or more miles of highways will be laid annually. The original \$27.5 billion cost estimate is being revised and may go above \$30 billion. Rising costs—for material, labor and particularly for rights of way—account for the new estimate. Material shortages are not so troublesome as expected. "I am not a bit concerned," said Bertram Tallamy, Federal Highway Administrator, "over the steel situation, as soon as the boys get in stride and get familiar with prestressed concrete."

Production of aluminum cans in pilot plant before the end of this year, and commercially by next spring is the aim of Victor Metal Products Corp., Newport, Ark. Victor Muscat, president, predicts one billion units will be produced annually by 1960. A new and cheaper method of producing aluminum slugs from which cans are made in an impact-extrusion process has been developed by Victor Metal Products, and is said to make commercial production of the seamless, rustless cans feasible.

The swimming pool boom is gaining momentum. By the end of the year, according to one estimate, there will be 100,000 private pools in the backyards of the U.S.A., compared with 2,500 as recently as 1948. New construction techniques have pared pool prices and credit financing is doing much to increase sales. According to J. F. Howard, treasurer of Paddock of California, about 35 percent of the 45,000 pools being installed this year will be financed by banks or loan companies.

Understanding the engineer is the special objective of a two-year secretarial course offered at Business Training College, Pittsburgh. Standard secretarial instruction is augmented by study of the terminology of the engineering profession and laboratory courses in physics and chemistry. Young women with this training are expected to adjust more quickly to their jobs and to free engineers from such duties as routine calculations and graph-plotting. The first graduating class of three students will finish this month; but 22 are expected to graduate in 1958 and double that number the following year. Phyllis E. Davis, dean of students, predicts that the idea will spread to other business schools.

A spray-on sealing material has been announced by Preco Chemical Corp., Farmingdale, L.I., N.Y. The cement-base material, Ceramix, is said to give walls a durable, impervious surface. Preco developed the product to make safe the decontamination of walls of a building at Brookhaven atomic laboratories which houses a filter and other water treatment units for processing uranium fuel elements. Normal spillage from this installation leaves radioactive salt deposits in the pores of the concrete walls. Now covered with Ceramix, the walls are hosed down daily with a cleaning solution and hot water rinses.

Heavy construction awards, nationally, totaled \$7,246.3 million for the first 20 weeks of 1957, as reported in **Engineering News-Record**. The total represents a drop of 18 percent below the corresponding period in 1956, but a one percent gain over 1955.

An 84-ft. conveyor boom of welded sheet aluminum with tubular struts resembling supports once used on biplanes has been designed by a former German aircraft engineer. This device makes possible higher stockpiling of sand during harbor unloading operations in Canada. Holden Sand and Gravel Co.'s sand barge Niagara, supplying material for Hamilton, Ont., construction projects, is equipped with the boom. Danger of tipping prevented use of a standard steel boom longer than 60 ft., so Carter Brothers, Ltd., went to Waldemar R. Petri, Galt consulting engineer, for the design of the boom which they later fabricated. Before coming to Canada three years ago, Mr. Petri was deputy chief engineer for Messerschmitt Co., and had solved a similar problem in minimizing weight during conveying of materials over the Grand River at Breslau.

An underground farming venture is being carried on in an old limestone mine leased from Medusa Portland Cement Co. near Wampum, Pa. The farm is realizing substantial harvests: in mushrooms. Michael and John Swanik, mushroom growers, explain that the constant year-round temperature of 50-53 deg., and the dampness and darkness of the mine provide ideal conditions for the crop, and that the farm annually produces up to 250,000 lb. of the edible fungus.

Currently underway at Grand Valley, Colo., is the experiment of Union Oil Co. of California to extract oil from shale. Recently visitors were shown the prototype plant which consists of facilities for mining, crushing and feeding the ore to a large furnace. Oil is extracted from the shale at a temperature of 700 deg. According to A. C. Rubel, president, it will be the end of the year before it is known whether the process will be economically profitable. A commercial plant, if installed, would add facilities for upgrading the oil for delivery by pipeline to the refinery. Batteries of retorts similar to the prototype furnace but larger, would have a capacity of more than 1,000 tons of shale a day. Mr. Rubel estimated that a plant turning out 15,000 to 20,000 barrels a day of shale-crude is five or perhaps ten years away.

Wyandotte Chemicals Corp., Michigan limestone producer, has scheduled an oxide products plant in Wyandotte for completion late this year. The plant will process polyethers which are said to improve product life and lower manufacturing costs of items embodying polyurethane foam plastics.

THE EDITORS

At Warner Co.'s Cedar Hollow Quarry Big AUTOCARS Keep the Crusher Working to Capacity

Warner Co.'s Cedar Hollow Quarry, near Phoenixville, Pa., supplies better than 550,000 tons of stone a year. It's a big operation calling for big hauling equipment. On the haul from quarry face to crusher, Warner uses three Autocar units. Two are Autocar 6-wheel gasoline tractors pulling 17-ton-capacity side dump semitrailers. The other is a Diesel 10-wheel truck, with a 17-ton side dump body, pulling a 17-ton full trailer with side dump body. As the grade is only 4%, Warner hooks this additional 17-ton load onto the Autocar truck, hauls double the payload with only one power plant and one driver. Loads of 100,000 lb. are commonplace, and the three rigs are sufficient to keep the crusher at Cedar Hollow working to capacity.

The haul from crusher to stockpile is steeper—about 12%. Here two single-axle Autocars of 15-ton capacity, one with a diesel engine, one with a gasoline, operate on a fast trip cycle. Since they replaced three 10-ton trucks, they are effecting a considerable saving on the operation.

Warner Co.'s daily cost records supply convincing evidence that the extra power and stamina built into every Autocar is an investment in hauling economy. Whether it's a double payload or a single one with a quick turnaround, Autocars perform with outstanding dependability. The Warner fleet, now 2 years old, has required no major overhaul, only routine maintenance. The quality is there, applied with custom engineering. Get in touch with your White-Autocar distributor and find out how these great trucks can make your operation more profitable.



AUTOCAR TRUCKS

AUTOCAR DIVISION

The White Motor Company • Exton, Pa.



How the Turner Lime and Rock Quarry

BOOSTED PRODUCTION 50 PER CENT WITH CAT-BUILT UNITS



Here's the kind of success story that every pit and quarry owner should know about:

It began five years ago when Franklin Turner, owner of a lime and rock quarry in Shelbina, Mo., started standardizing on Caterpillar-built units. At that time, production ran 400 tons per 8-hour shift—in fact, 250 tons was considered satisfactory.

Today, with his operation standardized on Caterpillar-built equipment, *production is 600 tons per 8-hour shift.* No wonder Mr. Turner says, "I'm very well pleased with the high production capabilities of Caterpillar-built units—and their low cost of operation."

His quarry is about 2 acres in area and 100 ft. deep. Overburden runs from 20 to 25 ft. and is removed by the powerful new Caterpillar D7 Tractor with No. 7S Bulldozer shown at work above. Among other jobs, the easy-to-maneuver D7 levels dumped rock on the stockpile.

For loading purposes, Mr. Turner has a Cat-built Traxcavator*. Efficient CAT* Diesel Engines power his L50 Lorain crane, a Chicago-Pneumatic air compressor and a Dixie rock crusher.

Standardizing on Caterpillar-built products has meant much higher production and bigger profits for Franklin Turner.

Let your Caterpillar Dealer show you how it can mean exactly the same thing for you. He's got figures to show you, too, and he's ready to demonstrate his products right on your job. And after you buy, you can depend on him to protect your investment with prompt service and parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

**WANTED—
THE HARD WORK**

EDITOR'S PAGE

Have 14 Minutes to Spare?

A LONG ABOUT 4:46 P.M. each workday—if your plant works an 8 to 5 shift, with an hour off for lunch—management starts to make its real profit for the day. Profit, that is, in terms of dividends to stockholders who put up money to make the business and jobs possible.

We're not sure what the average is for the rock products industries, but 14 minutes a day are the "profit minutes" for one reputable aggregates producer. Yours may be close to that figure. By comparison, the figure for the average manufacturing company is about 10 minutes.

It isn't much time, is it? Not nearly as much as the average person would guess. It takes some people longer than that to get ready to quit for the day. But it's an important period of time to everyone in your company. The idea, of course, is to extend it.

Based on one company's experience, here's how an average workday would be split into working periods to pay the cost of doing business:

Starting time is 8:00 a.m. It would be 10:48 before materials and supplies used that day would be paid for. By 2:17 p.m. wages and salaries would be accounted for, assuming one hour for lunch. All forms of taxes cost 1 hour 2½ minutes. Now, it's 3:19½ p.m.

Wear and tear on equipment used at the plant—the accountants call it depreciation—use 33½ minutes more. That moves the clock to 3:53 p.m. To pay for material taken from reserves (depletion and royalty) brings time to 3:58 p.m. The day is nearly over.

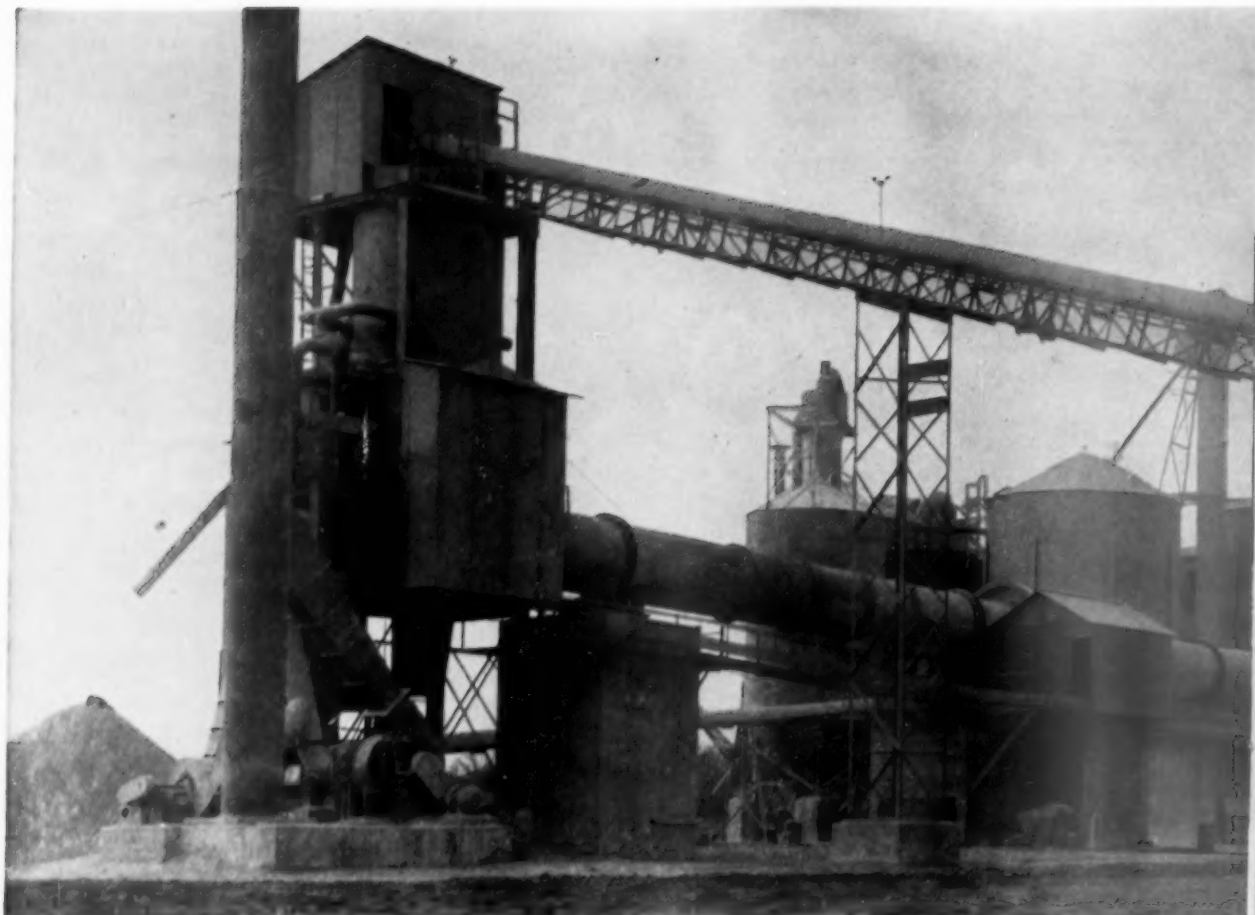
By then, all costs are taken care of except those for keeping the plant modern and efficient, to meet competition. This may be termed "reinvesting in the business." Normally, it is taken out of so-called profits, but it actually is a cost of keeping your business alive. To take care of that cost brings the time to 4:46 p.m.—**only 14 minutes to go.**

It takes 12 times longer, each workday, to pay for materials and supplies than it takes to pay the stockholder; 10½ times longer to pay for labor. The comparison seems out of line, doesn't it?

The facts highlight an incentive to increase the "minutes for profit" by management through more efficient operation—increased productivity rate. A company has to modernize to stay in business and to provide job security. It has to spend money to modernize. To spend money, it has to earn a substantial profit.

You have only a 14-minute period every workday to satisfy your stockholders.

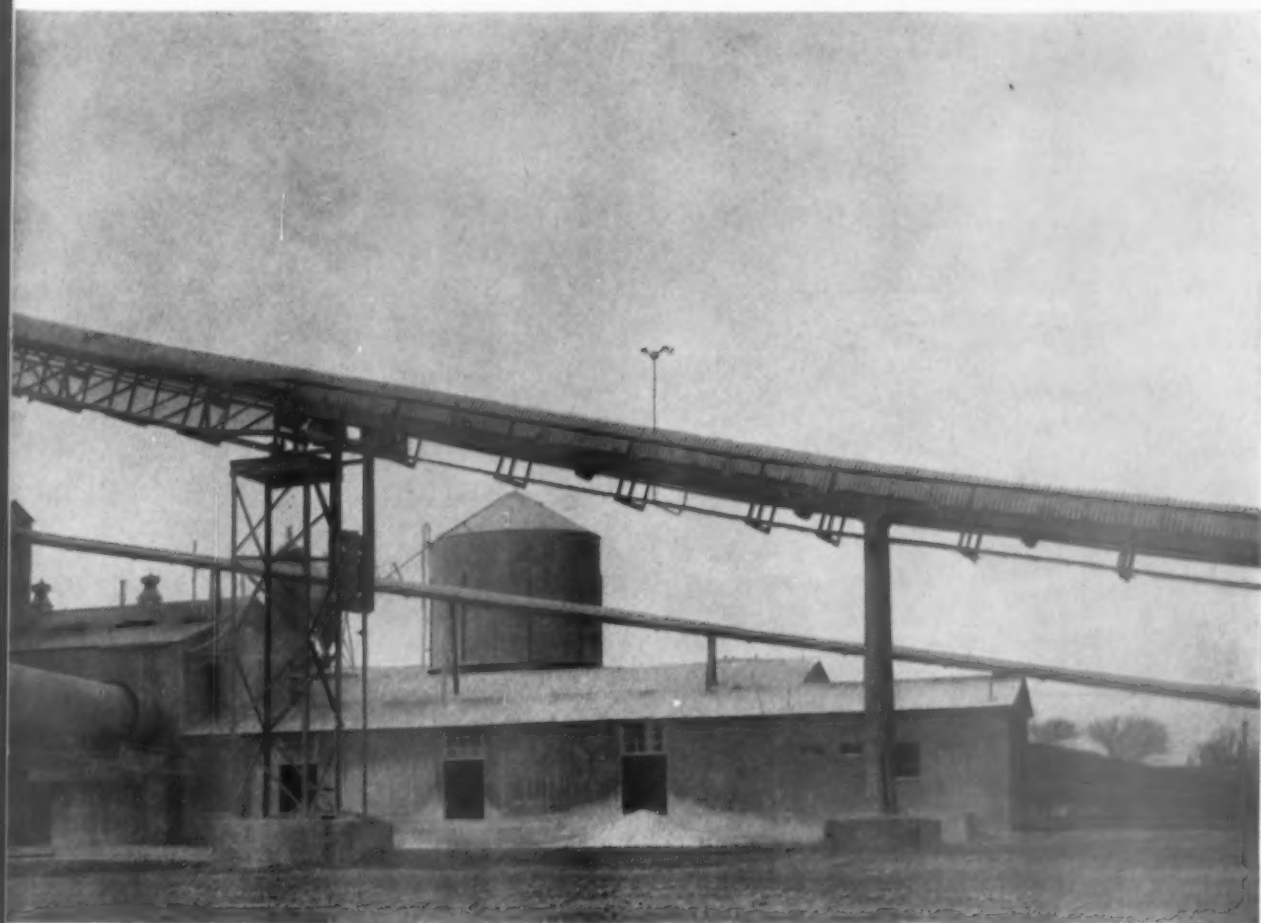
George C. Lindsay



▲ Gulf products are used exclusively in this pebble lime and hydrated lime plant of Linwood Stone Products Company, Davenport, Iowa. This sizeable operation includes a large rotary kiln for burning high calcium limestone.

At the Linwood quarry, J. F. McDonnell, Plant Superintendent, and Gunder Torstenson, Gulf Jobber, watch some of Linwood's heavy equipment at work. All equipment—in the plant and at the quarry—operates smoothly with Gulf quality fuels and lubricants.





Linwood Stone Products Company keeps equipment rolling smoothly with Gulf Quality Fuels and Lubricants

Trucks, shovels, crushers, conveyors, kilns—they all depend on Gulf products at Linwood Stone Products Company. There's a good, sound reason: Gulf fuels and lubricants help the cost-conscious men at Linwood to keep equipment operating smoothly, with fewer overhauls . . . fewer mechanical delays . . . lower maintenance costs.

For instance, Linwood reports that Gulf lubricants last up to three times as long as the lubricants they previously used.

Like to cut your operating costs, and get maximum performance from your equipment—both in your plant, and outside? Do as Linwood Stone

Products Company did: call in a Gulf Sales Engineer. He will be glad to analyze your specific problems, and make proper recommendations. Just contact your nearest Gulf office!

GULF OIL CORPORATION
1822 Gulf Building
Pittsburgh 30, Pa.



THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS



**YOU CAN'T
BARGAIN
WITH SAFETY**

Ski lift operators stress safety when it comes to buying wire rope. Too many lives are at stake. So they buy . . .

A Safe Lift

Even though you don't operate a ski lift, false economy can be costly in your rope purchases, too. For a rope failure can cause personal injury . . . wreck your equipment . . . throw off your entire work schedule . . . and affect employee morale. Yes, a "bargain" wire rope may save you money, yet cost you your peace of mind. Don't take a chance. Buy a rope that's a quality rope—buy Wickwire Rope.



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New York • Philadelphia

ROCKY'S NOTES

NATHAN C. ROCKWOOD



Recently Reported Research—Calcium Silicates

WE ARE BEGINNING TO FIND some affirmation of rather unorthodox views on physical or structural chemistry of the hydrated calcium silicates expressed in years past on this page. Although a working knowledge of the structural chemistry of inorganic substances in general is a difficult one for any student, an elementary understanding of the principles is not too difficult to comprehend, and is most helpful in getting some idea of just about how cement and concrete must function. The very term "physical" or "structural" chemistry implies a conception of mechanical as well as chemical methods of reaction.

Any study of cement and concrete should begin with a study of silicon and the silicates, including silicon dioxide or silica. It is apparently the special or peculiar properties of silica that give hydraulic cements usefulness. The builders in the days of the Roman Empire learned this by experience, and the British engineer, John Smeaton, discovered it as scientific truth in the middle of the eighteenth century. A particle of silica (or sand) is about as far from being "inert," as it is possible for any piece of stone to be.

As we have described previously, silica in quantity always occurs as groups of many, many tetrahedrons (four, equal-sided figures or pyramids) consisting of one silicon atom in the center attached or bonded to four oxygen atoms at each corner, and each oxygen atom between or bonded to two silicon atoms. Perhaps best conceived as four cylindrical oxygen atoms with one resting on a base of three others, with the silicon in the center cavity. In this way the valence charges of $+4$ on the one silicon, and -8 on the four oxygen atoms are compensated for or neutralized except on surfaces. When a particle of silica is broken, that is, when a new surface is exposed, a bond between silica and oxygen is broken, and there must

become available either one unused positive charge on each exposed silicon atom or one unused negative charge on each exposed oxygen atom. In other words, the silica has **surface energy**. That surface energy is utilized in adsorption, or chemisorption, of some element or substance like water which will compensate for or neutralize these unused positive and negative charges, which are or closely resemble charges of static electricity.

Dealing with finest of particles. One can get no idea of surface chemistry, or of colloids, or of structural chemistry, without some comprehension of the sizes of particles involved. For example, we will assume that the average size of a particle of portland cement is 40 microns (the size range is ordinarily from 5 to 100 microns). That 40 microns probably does not mean much to the ordinary reader, but particles of 40-micron size would pass a 325-mesh screen. However, in the units of structural chemistry 40 microns (μ) is 400,000 Angstrom units (A). Atoms, molecules and single crystals are measured in Angstrom units. Ordinary chemistry assumes reaction between atoms and molecules. Yet atoms and molecules, as individual particles, in the case of most minerals, especially silica, can exist only in very dilute solutions.

It can be seen, therefore, that any chemical reaction between silica or alumina and lime in a cement kiln to form clinker must be the result of the chemistry of surface energy. The surface energy of some minerals, like silica and alumina, is increased by heat, but their structure (lattice), or crystalline framework, is not destroyed until they melt. In the case of limestone, heat of course destroys its lattice or crystalline framework and a new product, lime, is formed. The lime also has potential energy, that the limestone did not have. This energy is equivalent to the energy or heat required to convert the stone to lime. Thus when particles of lime and particles of active silica are

Please turn to page 140

A CAT* Diesel has powered this shovel for 24 years

**...and still
running strong**



The Caterpillar Engine in this Lima shovel was installed at the factory in November, 1933. It's still producing—in a big way—for Calcite Quarry Corp., Lebanon, Pa.

Calcite purchased this shovel in 1942 and since then the engine has provided power to load 3 million tons of high-calcium rock. During a two-year stretch it operated 16 hours a day around the calendar.

"We can depend on this engine," reports president George Patten, "to give us a full day's work every day."

This kind of performance is one reason why dependable Caterpillar Engines are first choice at quarries everywhere. Caterpillar engineers have designed these engines to pack more power and deliver greater efficiency, greater economy and longer life. Their four-cycle design gives you a longer power stroke, resulting in smoother, more efficient operation than in two-cycle engines. There are no cylinder ports to clean. And

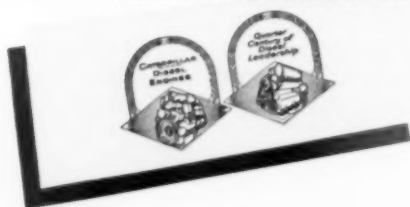
the exclusive fuel injection system permits you to use low-cost No. 2 furnace oil without fouling.

Caterpillar Engines have always been honestly rated. Now each engine comes to you with a signed and notarized certificate of the horsepower it will deliver.

Whatever your original or replacement needs, see your nearby Caterpillar Dealer. He has a full range of engines with *certified power* up to 650 HP (maximum output capacity). And he backs each engine with fast, efficient service and quality parts you can trust.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

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Washington Letter

Edgar Poe

Bright Outlook

There is cautious optimism in rock products trade association circles in the Nation's capital for the last half of 1957.

While there are some spotty exceptions, the overall picture for sand and gravel producers, cement manufacturers, crushed stone producers and the lime industry, is good and strong.

This is the forecast for the remainder of the year by industry spokesmen in Washington who keep their fingers on the problems and the economy of rock products. There are problems like rising wages and higher transportation rates.

One of the brighter reports is that by Housing Administrator Albert Cole. Mr. Cole says that the epoch-making road-building program is going to mean also the greatest home-building program of all time. This will mean new schools, churches, streets and shopping centers.

He said he is unable to pin-point when the record-smashing expansion program will begin, but it is certain to come. It could start this summer.

The substantial decline in home building thus far this year has had a noticeable effect on ready-mixed concrete in many parts of the nation. Home building is foremost single market of ready-mix.

The reduction in home construction has backed up on the materials industry in general. It has affected raw cement, sand and gravel, crushed stone and slag. There were 1,100,000 housing starts in 1956. Some authorities are confident 900,000 starts will have been recorded by Christmas. Even so a decline of 200,000 units will be felt by the industry.

Authorities say that while 1957 will not be as good as either 1955 or 1956 for the rock products industry as a whole, the year will be a prosperous one. The last six months should be considerably better than the first half year. The competent observers assert that 1955 and 1956 were boom years and, in some respects, were abnormal years.

Federal Spending

In the face of the budget trimming and general tightening up on spending, federal spending for civil public works, exclusive of

the highway program, may exceed \$1,750,000,000 for the 1958 fiscal year. Estimated public works expenditures for fiscal 1957 (ended June 30) amounted to \$1,455,000,000.

The proposed big school construction program which the Eisenhower administration is backing appears to have little chance of passage at this session. It has run squarely into the economy wave, plus the headaches of segregation.

More than \$55 million in federal funds became available July 1 for the federal-aid airport program for the new 1958 fiscal year. Matching funds are being made locally to cover 334 projects in the various states and territories.

Sen. Allen J. Ellender of Louisiana, chairman of the appropriations subcommittee that handles all money for the civil public works projects, lashed out at the Council of State Chambers of Commerce and the U. S. Chamber of Commerce for calling for a sharp cut in public works spending. During recent hearings he declared that the national chamber organization "obviously is unfamiliar with local and regional sentiment in favor of these projects which bring a return to all the nation."

Highway Program

The highway construction program is picking up momentum each month. A few states are still lagging in getting their programs going, but the responsible causes are being ironed out. The American Road Builders' Association says research shows that, under normal conditions, it takes from 16 to 20 months to locate a highway, acquire the rights-of-way, prepare plans and specifications, advertise, let the contract and launch the work.

Bid prices for the federal-aid highway building the first quarter of the year were 1.4 percent higher than for the corresponding period of 1956. Interstate construction alone awarded the first year of

the program will run more than \$650 million.

The accelerated road program is generating stepped up uses of bituminous concrete which is enjoying its greatest year in history. More state highway departments are using bituminous concrete than ever before. There is also a substantial expansion in all programs including highways, city streets, air strips and military projects.

Congressional leaders of both parties say there is no chance of passage at the current session of additional authorization for more mileage to the Interstate highway system. The general feeling in Congress as well as in industry circles is that the states should be allowed to get further along with the current building program for the next two or three years before expanding the interstate mileage. In a surprise action, the Senate public works subcommittee approved an amendment that would increase the program by 7,000 miles and extend it from 13 to 20 years.

Authorities point out that an enormous job lies ahead in the construction program—the greatest the world has ever known. The total money that has been appropriated for river and harbor work since 1872 and spent under the jurisdiction of the Corps of Army Engineers is small as compared with the projected grand total of federal and state money on all federal-aid roads of about \$50 billion.

Loans to Producers

The Small Business Administration, which has made some loans in the rock products field, appears likely to become a permanent federal agency. It was supposed to expire July 31, but new life was breathed into the setup.

A major point at issue has been how much interest should SBA charge its borrowers. SBA from September 1953 through April 22, 1957 approved 5,896 loans totaling \$278,534,000.

No Tax Cut This Year

With federal taxes nearly as steep now as they were when Japan surrendered, Congress is being prodded to action.

As Congress headed into the final phase of the 1957 session the question of an immediate tax reduction rested on the final outcome of the "Battle of the Budget." No great reduction in federal spending in fiscal 1958 is yet in sight. Leaders of both parties on Capitol Hill are maintaining that while there is an imperative need of relief from the tax burdens, which is near an all-time high, a cut is premature until there can be a reduction on the national debt.

It is doubtful that there will be a tax cut voted this year. Next year is election year. If sentiment

for a reduction is still prevalent chances are there will be general rate reductions all along the line.

More than 850 tax reduction bills of various kinds, many of them identical, have been introduced at this session.

Road Building Materials

A shortage of good road-building materials in some sections of the United States has been felt for some time. Now as a result of heavy consumption, it is becoming more serious. In an effort to overcome some of the deficiencies, highway departments are trying to improve soils with chemical additives. Engineers agree that bases of superior quality will cost less "in the long run" because they will cost less in road maintenance.

Lime stabilization of secondary roads is becoming more prevalent in connection with the new construction. This is especially true in Texas and Louisiana, but other states with material deficiencies are increasing their uses.

Soil stabilization is not new to many engineers and there are other soil stabilizers besides lime.

A spokesman for the lime soil stabilization people said that the market is expanding at quickened pace because engineers know of the upgrading values. Transportation cost of plentiful supplies of materials are too expensive to ship to the scarce areas. Therefore, he said lime as a soil stabilizer is having its greatest boom and has still a greater future ahead.

There are approximately 120 lime plants in the country doing business in the open market. The Bureau of Mines lists a number of additional ones, but some are supplying only private industries.

Roads for Parks

The federal government, as a result of the big growth in population, is setting aside thousands of additional acres of government-owned lands for public parks. Both forestry lands and interior department lands are included in the new allotment.

New roads and buildings will be erected in the future park areas. Bills calling for spending more than \$500,000,000 on timber access roads, under the federal highway act, are pending in Congress.

Some government economists predict that the time is near when the average work week will be no more than 32 hours. Women already are drawing social security checks at age 62. Therefore, more and more people will be streaming to the forests, woodlands and parks for recreation.

END

PETTIBONE SPEEDALL



Pettibone SPEEDALL Tractor Shovel
Model 250—3½ cubic yard capacity

P&H DIESEL POWER



P&H Industrial Diesel Engine
3 cyl. Model 387C-18

the best combination for **EXTRA POWER .. EXTRA PRODUCTION**

Here's how to make a good machine better! Specify Pettibone SPEEDALL Model 250 *powered with a P&H Diesel.*

A responsive engine with high torque and lots of reserve strength, the P&H Diesel supplies power to handle heaviest digging at a high rate of speed—to handle peak loads without stalling. Downtime for restarts, servicing and repairs is held to a minimum.

The P&H Diesel provides other profitable performance features:

- **Faster Starts**
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Efficiency and simplicity of P&H Diesel design assure lowest operating and maintenance costs. The P&H Diesel operates economically on low cost No. 2 diesel fuel. It has 25% fewer parts. All wearing parts are interchangeable.

Specify the P&H Diesel for all your construction equipment. For additional information on P&H Diesel powered SPEEDALLS see your Pettibone dealer or write for Bulletin Z-26.

HARNISCHFEGER



DIESEL ENGINE DIVISION, Crystal Lake, Ill.

How would you decide?

A roundup of actual day-to-day in-plant problems
and how they were handled by management men



Can you discharge a "perfect worker" for being a loan-shark on the side?

What Happened:

K WAS INDEED A GOOD EMPLOYEE by every company standard. He was never absent, and in 17 years was late only once. On several occasions he received commendations from the company for good production.

One day the personnel director of the company received an anonymous telephone call from a woman. She said that she was the wife of one of the company employees, and that every week when he came home, his pay

was short. Was he gambling, or what? She wanted to know.

Upon investigation it was discovered that the employee had been paying off a loan to K. When K was interviewed, he admitted that he was carrying on "a small loan business" on the side and charging 20 percent interest a week. He had about a hundred regular "clients." In addition, he cashed checks at 10 cents each. The company fired him immediately. K took up his own cause and filed a grievance which went to arbitration. His contentions were:

1. I was doing wrong but I shouldn't be fired.
2. I should have been given a warning first, and I would have stopped immediately.
3. How about my 17-year record of good work—doesn't that count?

The company was unimpressed, and in turn it argued:

1. K was operating an illegal business. Under the laws of the state, he could be sent to jail for operating a loan agency without a license and charging more than the legal interest-rate.
2. We are not required to give a warning when an employee is guilty of an illegal act.
3. If we agreed with K and disciplined him without discharge, we would have to set up machinery for checking up on him to see that he doesn't repeat his offense. We are not in the detective business. We're much too busy with production.

Was the company:

Right? ☐ Wrong? ☐

What Arbitrator S. H. Jaffee ruled:

"The ultimate question is whether what K did is cause not for discharge but, especially because of his clean record of 17 years, cause for something less. In this connection, the union points out that K was never warned by the company that what he did was against company policy, and the union asserts that had he been so warned he would have stopped. . . . He knew that what he did was wrong. He must, and certainly should have known that the company would disapprove. He needed neither company rule nor warning for that. There are many situations where a dereliction without a previous warning would not warrant discharge. This is not one of them. The nature and scope of the dereliction was too great to impose that requirement. K was discharged for adequate cause."

(Continued on page 26)

Each incident given in this department is taken from a true-life grievance which went to arbitration. Names of some principals involved have been changed for obvious reasons. Readers who want the source of any of these cases may write to Rock Products.

HOW TO PRODUCE TOP-QUALITY AGGREGATES

TELSMITH

Equipment

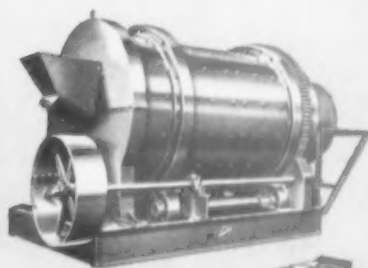
for SCRUBBING · WASHING · CLASSIFYING



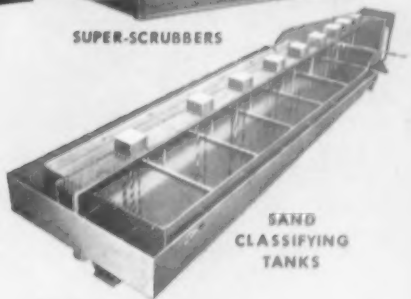
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This new 20-page bulletin shows the most modern and most efficient machinery for producing top-quality aggregates of the proper gradation to meet the most strict specifications. Helpful pictures, tables and complete information including sizes and capacities.

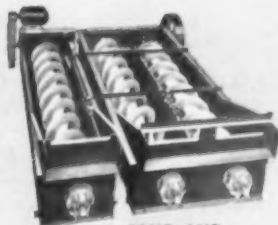
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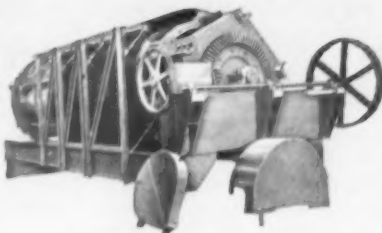
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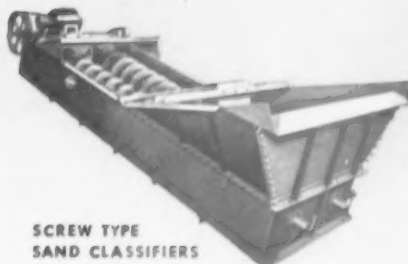
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ROCK PRODUCTS, July, 1957

25

Labor Relations

Continued from page 24



Is it a quit when a worker takes a vacation without telling anyone?

What Happened:

FRED LORD COULDN'T get the vacation time he wanted. It conflicted with Harry Tyler's who had seniority. The company told Lord he could have those particular two weeks—if he could get Tyler to change. Tyler said "no." So Lord said he wouldn't take any vacation—he would take vacation pay instead. However, Tyler changed his mind. When the time came, Lord took off on the vacation he'd originally asked for—but he didn't tell anybody he was going. When he returned, the company told him that he'd quit and couldn't have his job back. Lord appealed:

1. He had said nothing whatever to anybody about intending to quit.
2. The company had told him that if Tyler agreed, he could have the two weeks he wanted.
3. When Tyler did agree, he felt he had no reason to think that any further discussion was necessary.

The company didn't go along with this reasoning at all, and claimed:

1. There was two weeks between the time Tyler changed his mind and the time Lord went on vacation. He had plenty of opportunity to tell the company he was going, but he just didn't bother.
2. The schedule was planned on the understanding that Lord would be at work during that time, and his absence caused considerable trouble.

3. There was no other reasonable conclusion, but that Lord had quit.

Was the worker:

Right? ☐ Wrong? ☐

What Arbitrator Donnelly Ruled:

"Lord informed the company that since he could not get the weeks of vacation he wanted he would not take any vacation, and would take his vacation pay. Several witnesses testified that this was the understanding of the supervisors, and it was common knowledge in the yard. Tyler testified that when a man has made a selection on the vacation preference sheet, the company does not generally discuss the selection with him unless there is a conflict. Ordinarily, therefore, Lord would

be acting properly had he followed his selection without further notification to the company. However, the matter of Lord's vacation was discussed with the company. The decision was that he would take no vacation, and despite any general policy to the contrary, certainly there was an obligation to again discuss with the company any new plans for a vacation. Although he had two weeks in which to do so, he did not discuss any vacation plans with the company. It must be reasonably presumed that he knew he should, and that he knew that the company was planning on his services for that two weeks. Without reasonable cause, Lord failed to report for his scheduled work hours and the company was justified in concluding that he had quit his employment."



Should you discipline an employee for not reporting a work error?

What Happened:

KEN LOCKHARD was a maintenance man. One day he was installing some pipe in a tank when he found that he had cut some holes in the wrong places. He didn't report his mistakes—but just patched them up. A few days later the mistake was discovered. Lockhard was given a four-day layoff. He grieved on the grounds that there was no written rule which required employees to report mistakes to supervision.

Was Ken:

Right? ☐ Wrong? ☐

What Arbitrator I. R. Feinberg Ruled:

"The existence of a written rule or rules outlining proper conduct is not always necessary for a determination of whether an employee's conduct is proper. The Arbitrator believes that, although there was no evidence that a written rule existed requiring the reporting of work errors, and it is not too clear that employees were definitely told that errors of this nature should be reported, the error should have been reported. Discipline, in our opinion, is warranted."

END



**PRODUCTION OF
SPECIFICATION
FINE AGGREGATES
at
WIDELY SCATTERED PIT SITES!**

with the
**Eagle Portable Washing-
Classifying-Dehydrating Section**



On many jobs mobility means money—you have it with this "Eagle on wheels". Size and weight permit highway travel from pit to pit. Quickly attached to semi-tractor. Can be hauled to pit and positioned next to screen. Washer side flares—removed for travel, as shown—are quickly installed, water connection is made, and you're ready to operate!

Operating in a dry pit or with hydraulic dredge, the unit removes excess silt-laden water and classifies the desired aggregate which is dehydrated by the two screw washer-classifier-dehydrators. Material delivered suitable for handling by conveyor to stockpiles or bins, or by trucks. Both screws can produce same product or each can produce a separate gradation—facilities provided to remove overage of any excess sand meshes.

This simple, compact, economical Eagle Portable Section can process up to 200-tons per hour of specification material. Design based on Eagle's long experience and field testing. Get the complete story—send for Bulletin 557.

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Fast take-down, transport and erection means less down time when changing pits.

Flexibility—use both screws to produce one product or produce a different gradation with each screw.

Field-proved automatic bleeder valves give attention-free operation—minimum man power.

Easy manual control of Splitter Gates with Blending Flumes adapts unit to variety of pit conditions.

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Work Bulls pay off

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Work Bulls provide the right tractor power with design-integrated attachments to build profit on these and scores of other jobs!

42 hp DAVIS PIT BULL

(far left) is equipped with hydraulically controlled $\frac{7}{8}$ -yd. loader. Same arms as used to mount loader also mount other attachments including fork lift and utility boom. The Pit Bull features a torque converter plus combination foot feed and reversing clutches as standard equipment . . . frequently outworks bigger, more expensive shovel-loaders.

34 hp WORK BULL MODEL 202

(background) is a low-cost, exceptionally versatile machine. Here, it hauls compressor . . . can also be used to skid machinery, shunt mine cars and handle many similar hauling or towing assignments. Available attachments include post hole digger, utility dozing and grading blades, loader, backhoe and fork lift.

52 hp WORK BULL MODEL 404

(right foreground) is biggest, most powerful tractor in line. Available with either gasoline or diesel engines, it has five forward speeds and reverse. Power steering is optional. Attachments available for this as well as other models include a powerful, rear-mounted hydraulic backhoe which handles 12 to 36-in. buckets, digs to depth of 12 $\frac{1}{2}$ ft.

... as primary equipment

Work Bulls give both large and small pit, quarry, sand and gravel or mining operators a great new opportunity to put former hand labor, or work too small for their present equipment, on a paying power basis. Work Bulls also pay off on small, scattered work-and-run assignments. And they'll earn their keep off-season, too. You can use them or lease them out for snow removal, scores of other money-making jobs.

... as backup machines

Team Work Bulls with bigger, more expensive, single-purpose rigs. You get the exact power/equipment cost ratio the job demands. And you increase equipment scheduling efficiency . . . cut down on overhead. What's more, Work Bulls travel anywhere without expensive trailers or special travel permits. Thus, it's highly practical to shoot them from site to site as your production picture changes.

... as utility or cleanup tools

When you're using shovels to clean up spill in the loading area, big graders to smooth haulroads, crawler dozers to haul wagons or skid light and medium-weight machinery — there's a profitable place for Work Bulls on your job. Low in initial price, hourly cost and upkeep — Work Bulls provide a perfect means to efficiently handle a wide range of cleanup and utility jobs.

Work Bulls have a profitable place on every project. Check to see which of the 5 tractors (34 to 52 hp) and 20 easily interchangeable attachments you need. Write for free 24-pg. catalog and the name of your Work Bull distributor.



M·H·F WORK BULLS

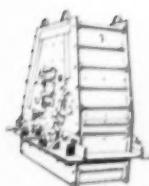
Division of Massey-Harris-Ferguson, Inc.

26-C Quality Avenue

Racine, Wisconsin

Enter 1597 on Reader Card

ROCK PRODUCTS, July, 1957

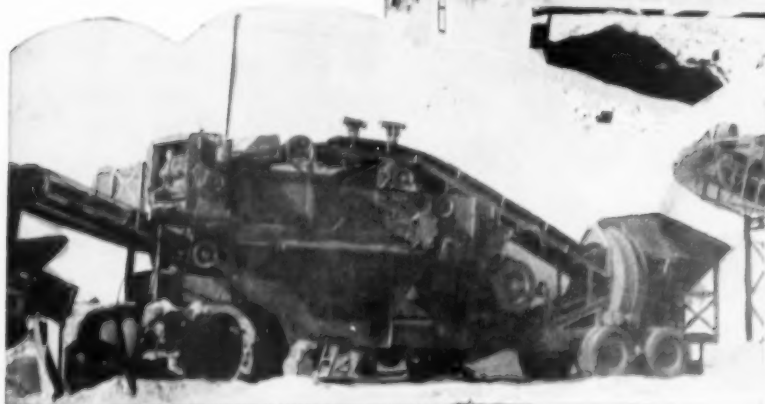
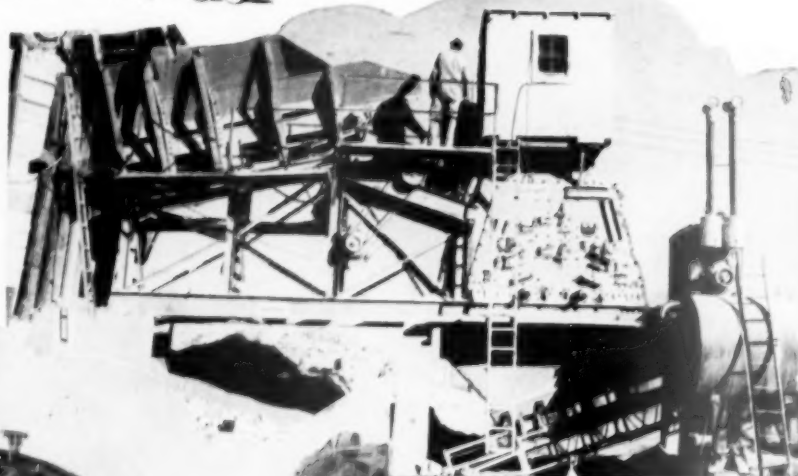


**Cedarapids
Skid-Mounted Primary
Portable Secondary
Combination . . .**

**PRODUCES BIG VOLUMES
OF STRICT-SPECIFICATION
AGGREGATE**



Cedarapids "Packaged" skid-mounted stationary 3645 Double Impeller Impact Breaker produces a high percent of required smaller sizes in the primary reduction operation. Cedarapids 36" x 14' Feeder feeds quarry rock onto a single deck 40" x 6' Vibrating Grizzly to by-pass fines around the Impact Breaker.



Material from the Double Impeller is conveyed to a surge pile and is then fed into this Cedarapids Portable 4033 Hammermill Secondary Plant. Oversize from the top screen deck goes through the hammermill for secondary reduction, while material passing the $\frac{3}{4}$ " bottom screen deck is delivered directly to the Cedarapids screen-bin unit.

**MAXIMUM PRODUCTION
OF SPECIFIED SIZES**

$\frac{3}{4}$ " to $\frac{3}{8}$ " MATERIAL		
Size	Minimum	Maximum
1"	100	
$\frac{3}{4}$ "	95	100
$\frac{1}{2}$ "	50	90
$\frac{3}{8}$ "	10	40
No. 4	1	10
No. 8	1	6
No. 30	1	6
No. 50	1	6
No. 100	1	5
No. 200	1	4

LIMITS— $\frac{3}{8}$ " Chip Material

Size	Minimum	Maximum
$\frac{3}{8}$ "	100	
No. 4	60	80
No. 8	40	55
No. 30	17	28
No. 50	17	25
No. 100	15	22
No. 200	11	17

The combination of a Cedarapids 3645 Double Impeller Impact Breaker and a Cedarapids Portable Hammermill Secondary used by Beu & Sons Co. of LaPorte City, Iowa, is producing 70% of $\frac{3}{8}$ " minus and 30% of $\frac{3}{4}$ " material at an average 220 ton per hour production rate . . . and as high as 5800 tons of $1\frac{1}{4}$ " in 18 hours . . . with a high crushing percentage. Look at the screen-analysis table on this plant's production. This type of operation proves the versatility and productivity of Cedarapids equipment for turning out strict-specification aggregate in the tonnages demanded.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U. S. A.

Enter 1545 on Reader Card

PEOPLE

IN THE NEWS

Winners of Dravo Corp. Technical Papers Competition



W. L. Price, D. H. Marlin, J. H. Patterson, Jr., and C. W. Granacher (left to right)

W. L. PRICE, engineering manager of the Keystone division, and D. H. Marlin, research engineer, Dravo Corp., Pittsburgh, Penn., won \$300 in the Dravo Corp. annual Technical Papers Competition, for their paper on "Abrasion-Resistant Materials Used in Sand and Gravel Production." The third prize of \$200 was awarded to J. H. Patterson, Jr., field engineer in the contracting division, author of "Taming the Long Sault Rapids," and B. R. Baier, design engineer in the engineering works division, received \$100 for his paper on "Ore Unloading Bridges for McLouth Steel Corp." Honorable mentions of \$50 each were awarded to G. P. Smith, purchasing agent for the machinery division; E. N. Hower, manager of industrial department of the machinery division; and J. A. Anthes, process engineer. Mr. Smith's entry discussed "The Human Side of Purchasing" while Mr.

Hower and Mr. Anthes collaborated on a study of pelletizing and sintering fly ash. C. W. Granacher, project engineer in the contracting division, and winner of the first prize for the second consecutive year, received \$500 for his paper on "Construction of the Main Piers for the Mississippi River Bridge at New Orleans."

Alpha President



R. S. GERSTELL, executive vice-president, has been elected president of Alpha Portland Cement Co., Easton, Penn., to succeed J. F. Magee, executive officer, who has been named chairman of the board. A graduate of Princeton University, Princeton, N.J., Mr. Gerstell joined Alpha in 1917. He was vice-president in charge of sales from 1949 to 1955.

Howard Hanks has retired as vice-

president in charge of manufacturing but will continue temporarily as a consulting engineer. E. F. Brownstead has been appointed to the position of general manager of operations.

Officers re-elected to one-year terms are: J. D. McKelvy, vice-president; N. O. Wagner, vice-president in charge of sales; K. T. Wright, secretary and treasurer; and H. F. Stepanek, assistant secretary and assistant treasurer.

Empire State Officers

JOHN B. HOPKINS, president, Albany Gravel Co., Inc., Albany, N.Y., was elected president of the Empire State Sand, Gravel and Ready Mix Association at its recent annual convention. George R. Krom, Windsor Building Supplies Co., Newburgh, was elected vice-president; Harold Keahon, Keahon Brothers, Pearl River, secretary; and Richard M. Burgess, St. Johnsville Supply Co., Inc., St. Johnsville, treasurer. Paul R. Smith was re-elected executive secretary.

Directors elected for three-year terms are: Ludwig Kahle, Pine Hill Concrete Mix Corp., Buffalo; Thomas Moogan, Thomas Moogan Sand and Gravel, Friendship; and Hugh McCracken, Gallagher Bros. Sand and Gravel Corp., New York. Charles C. Wing of R. B. Wing & Son Co., Albany, was named an associate member of the board.

Chief Engineer

D. C. HICKEY, JR., formerly construction engineer, has been named chief engineer of The General Crushed Stone Co., Easton, Penn. Associated with the company since 1940, Mr. Hickey served as plant superintendent before he became construction engineer in 1945.

Chairman of the Board

A. K. HUMPHRIES has been elected to the newly created position of chairman of the board, Pacific Cement and Aggregates, Inc., San Francisco, Calif. R. K. Humphries, formerly vice-president and general manager, succeeds him as president of the company.

(Continued on page 33)

Bessemer Officers Re-elected

FRANK B. WARREN has been re-elected president of The Bessemer Limestone and Cement Co., Youngstown, Ohio. Other officers include H. E. Reed, vice-president in charge of operations; A. E. Harpold, vice-president in charge of sales; H. G. Hinson, secretary and treasurer; Lula M. Kivine, assistant secretary; and R. L. Rosenberger, assistant treasurer. Directors A. E. Adams, Jr., W. E. Bliss, David E. Jones, R. C. Steese and Mr. Warren are on the executive committee.

D Ingersoll-Rand **DRILLMASTER**



THIS DRILLMASTER PERFORMANCE SOLD FIVE MORE UNITS!

The performance of the Ingersoll-Rand Drillmaster shown above, in the quarry of a large midwest lime producer, has resulted in the sale of five additional units — to other operators who came, saw and were convinced.

This completely self-contained and self-propelled blast hole drilling rig has been in operation for over a year. Using an I-R "down-the-hole" drill and 6½" Ingersoll-Rand Carset Jackbits, sinking 60-ft holes with 18-ft spacing and 24-ft burden,

this Drillmaster has consistently maintained a drilling speed of 25 feet of hole per hour, including moving time. Bit life in this dense, hard to drill limestone has exceeded 6,500 ft.

If you're interested in cost-cutting *performance*, see the Drillmaster in action. We will be glad to arrange for a visit to an operating unit — and to help you evaluate its performance in terms of your own drilling conditions. Ask your Ingersoll-Rand representative or write for further details today.

Ingersoll-Rand
11 BROADWAY, NEW YORK 4, N. Y.



THE BEST AIR EQUIPMENT FOR BETTER HIGHWAYS

Enter 1549 on Reader Card

PEOPLE IN THE NEWS

(Continued from page 31)

Gypsum Association President



JOHN W. BROWN, senior vice-president in charge of sales and marketing for the National Gypsum Co., Buffalo, N.Y., has been elected president of the Gypsum Association, Chicago, Ill. He succeeds C. E. Harper, vice-president and manager of Kaiser Gypsum Co., Oakland, Calif.

Southwestern Promotions

HAROLD S. SPARKS has been promoted from superintendent to general superintendent of the El Paso, Texas, plant of Southwestern Portland Cement Co., Los Angeles, Calif. Otto P. Kroeger, formerly chief chemist at the plant, succeeds Mr. Sparks as superintendent. Forrest L. House has been named assistant superintendent, and G. B. Moore, research manager, replaces Mr. Kroeger as chief chemist.

Executive Vice-President

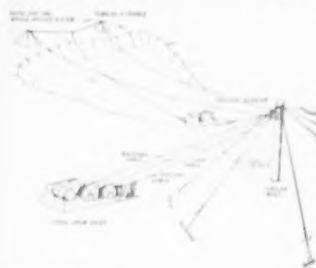
WALTER F. LAW has been elected executive vice-president of the Lone Star Cement Corp., New York, N.Y. He had been vice-president of the Alabama Division, Birmingham, Ala., from 1949 to 1956.

Great Lakes Carbon Managers

G. A. RUSSELL, formerly general sales manager of the dialite division of Great Lakes Carbon Corp., Los Angeles, Calif., has been named general sales consultant of the newly organized mining and mineral products division, a consolidation of the dialite and perlite divisions, until his retirement in October, 1957, according to

(Continued on page 36)

Three Sauerman Methods for Cutting Excavating and Reclamation Costs



DIGGING and CONVEYING

Rapid Shifting DragScraper—Using a rapid shifting bridle system, a 4-cu. yd. DragScraper digs 200 cu. yds. per hour from an 80-acre gravel deposit. Rapid Shifter permits selection of desired sizes from various pit locations to obtain a proper mixture.



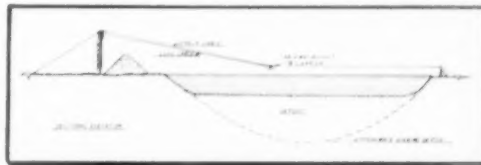
STORAGE and RECLAMATION

DragScraper—Clay reclamation from this 200-ft. storage shed is efficiently handled by a 1-cu. yd. DragScraper. From the controls of the Sauerman Hoist, the operator can reclaim to hopper from any part of the shed area. Winch at left provides power for lateral shifting of tail block and trolley on monorail.—*Sauerman News No. 140.*

UNDERWATER RECOVERY

Slackline Cableway—This cableway excavator is digging 50 ft. below water and delivering to a 60 ft. surge pile. Average haul is 600 ft. The slackline permits building a large stockpile due the height of discharge. (Drawing shows details of typical slackline installation.)

—*Sauerman News No. 141.*



Find out what the Sauerman Method can do for you

Give us details on your operation. Our engineers will give prompt recommendations and work with you to provide the best method for your requirements. Ask for Catalogs A (DragScrapers) and C (Slackline Cableways).

SAUERMAN

BROS., INC.

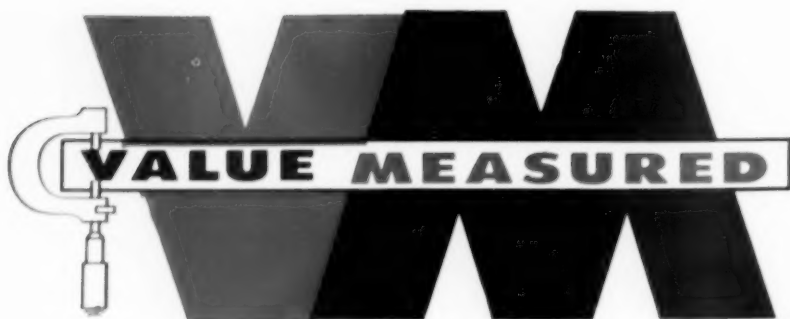
630 SO. 28th AVE.
BELLWOOD, ILL.
Cable CABEX—Bellwood, Ill.

Crescent Scrapers • Slackline and Tautline Cableways • Duralite Blocks

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YOUR INTERNATIONAL DISTRIBUTOR

proudly announces



**The exclusive equipment
buying plan that
Value Measures used
machinery and its component
parts before you buy!**

Your International Distributor proudly announces VM...a revolutionary equipment buying concept that measures the value of used machinery and its components before you buy! Now, under this exclusive International Distributor program, you can have a reasonable answer to your most important question when buying used equipment..."What can I expect of this machine and for how long?"

The answer is supplied in two ways, not only for the over-all condition of the machine but also for all the major parts of the machine as well! And the answers are easy to get. They're all tabulated for you on big tags, (see illustration, above), which are attached to the component or near it. Each tag names the component, gives you the over-all condition of it, tells the approximate hours of operation (because parts are changed in units at different times), and shows whether the item has been repaired or replaced with a new part. The tags permit you to examine a piece of used machinery quickly, com-

pletely, and with confidence. In fact, VM—the IH Value-Measured Used Equipment Plan—does for you what you yourself would like to do to check used equipment, if you had the time and facilities.

Your International Construction Equipment Distributor has Value-Measured Used Equipment buys on his lot, now. Be sure to see him soon and find out why VM is your best way to buy used construction machinery.



Clean-up! A Value-Measured Used Equipment buy first gets a steam bath before inspection of major parts. Clean machine reveals wear, cracks, other damages which need repair.

Check up! Dynamometer engine testing is typical of thorough inspection and testing before and after worn engine parts are replaced. Testing equipment of this type enables distributor to guarantee performance on VM equipment.

Fix up! After testing, distributor servicemen make necessary repairs and adjustments to equipment. All such repairs and their cost are tabulated on VM tags which you'll find conveniently attached to the components.

Measure up! You'll find the VM buy headquarters sign only at your International Construction Equipment Distributor. Stop here soon if you need used construction equipment...and become acquainted with the industry's newest, safest, and most economical way to buy used machinery...the VM way.



VM Purchase Certificate is your guarantee that every major working area of the used machine has been thoroughly checked and repaired, or replaced, when necessary. It also means your VM used machine is the best buy for the price.



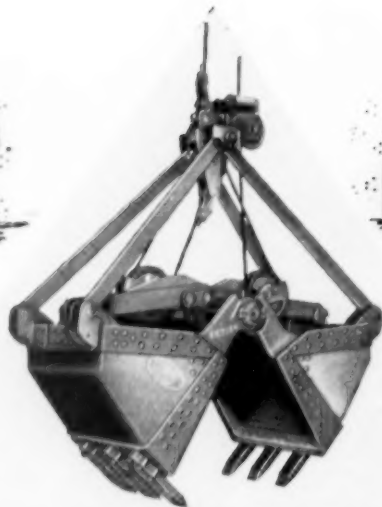
INTERNATIONAL CONSTRUCTION EQUIPMENT

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.



YESTERDAY



TODAY

BUCKETS CHANGE TOO

**KIESLER LEADS
WITH THE MIGHTY**



**THE WAY . . .
ICE TONG PRINCIPLE!**

There's no doubt about it: whether you are excavating, rehandling coal, sand, crushed stone, or slag, you want a bucket that DIGS DEEP AND DUMPS FAST! And for THE bucket that DIGS DEEPEST and DUMPS FASTER — AT NO ADDITIONAL COST — the name is KIESLER!!

The reasons for that PROVEN claim are these: the exclusive shell design of all KIESLER buckets . . . while designed to hold the greatest loads . . . gives a sharper dumping angle so that dumping begins the instant that the jaws start to open (not only when they are wide open). This affords the operator spot dumping . . . avoids spillage . . . and thus . . . reduces handling costs to a minimum.

Equally important, KIESLER buckets — and only KIESLER applies the age-old principle of leverage through BOTH lever arms. Thus power is applied EQUALLY to BOTH shells . . . without unnecessary parts to the line, with less cable, without extra dead weight.

The results: a bucket that DIGS DEEPER and DUMPS FASTER . . . a bucket that will still be in operation after other buckets are junked.

GUARANTEE

Kiesler Buckets are guaranteed to outperform and do a bigger day's work than any other Bucket of equal weight, width and size, when properly reeved and operated.

JOS. F.

KIESLER^{co.}
Since 1892

944 W. HURON ST. • CHICAGO 22, ILL. • MOntrope 6-7144

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PEOPLE IN THE NEWS

(Continued from page 33)

an announcement by D. Loring Marlett, vice-president and general manager of the new division. E. J. Manion, formerly assistant general sales manager of the dicalite division, has been promoted to general sales manager of the new division, with headquarters in Los Angeles. Gordon G. Halvorsen, formerly district sales manager of the dicalite division, Cleveland, Ohio, has been appointed assistant general sales manager of the new division.

Mr. Russell has been with the dicalite division in a sales capacity for over 25 years, and has been general sales manager for about two years.

Mr. Manion, a member of the dicalite division sales department for 15 years, was district sales manager, New York City, for 13 years until transferred to Los Angeles in 1956.

Mr. Halvorsen has been with the dicalite division for 17 years, serving as a chemical engineer in the research and control laboratory at Waltheria, Calif., and then as district sales manager in Cleveland.

On Board of Directors

EARLE T. ANDREWS, vice-president of operations, and William J. Woods, Jr., vice-president of sales, Pennsylvania Glass Sand Corp., Lewistown, Penn., have been elected directors of the company.

Ohio Association Officers

J. E. MARTIN, owner of the Enon Washed Sand and Gravel Co., Enon, Ohio, was elected president of the Ohio Sand and Gravel Association at its recent meeting in Columbus. W. E. Hole, Jr., American Aggregates Corp., Greenville, was elected vice-president, and W. E. Pohlman, American Aggregates Corp., treasurer. Claude L. Clark was re-elected executive secretary. Walter Steiner of Steiner's Washed Sand and Gravel Co., West Milton, was named to serve on the board of directors with J. E. Martin.

Named to Employer Board

BRUCE G. WOOLPERT, vice-president, Granite Rock Co., Watsonville, Calif., has been elected to the board of directors of the California Association of Employers. Mr. Woolpert is also chairman of the Watsonville Employers Council.

(Continued on page 41)

Here's **MORE** efficient driver speed for **HEAVY** **Loads**

ALLIS-CHALMERS **TEFC Wound-Rotor** **MOTORS**

Where high inertia loads must be accelerated quickly and smoothly — yet power supply is limited — the Allis-Chalmers wound-rotor motor proves its efficiency . . .

High starting torque with this motor requires relatively low line-current. In addition, adjustable acceleration and running speed are possible through use of simple controls.

Other features of the TEFC wound-rotor motor include:

- 1. Rib construction** provides ample cooling surface.
- 2. Single enclosure** surrounds stator, rotor, slip rings, brushes and brush rigging. Gives maximum protection in moist, dirty, corrosive or hazardous atmosphere.
- 3. Cast-iron frame** contributes rigid, distortion-free bearing support and keeps alignment true.
- 4. Easy access** to collector rings and brushes permits on-the-spot inspection of brushes and commutators.

If you use hoists, lifts, cranes, conveyors, crushers or mills, find out more about the "MORE" in Allis-Chalmers wound-rotor motors. A-C motors also are available in various open types. Contact your nearby A-C sales office, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.

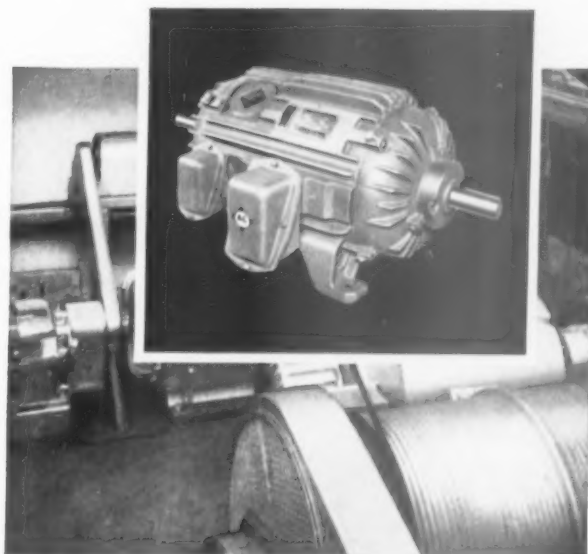


A-5180

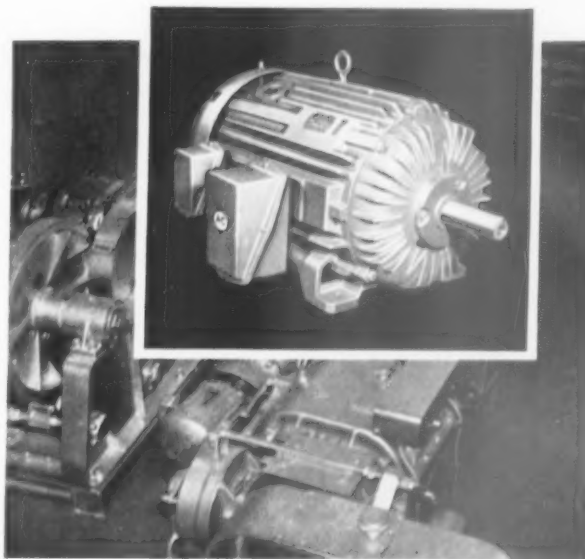
ALLIS-CHALMERS

ROCK PRODUCTS, July, 1957

Enter 1544 on Reader Card



For intermittent duty, this totally-enclosed, non-ventilated model is available in frame sizes 284 to 505 inclusive. Above 505 frame, Allis-Chalmers offers its famous tube-type motor.



For continuous service, this tough, fan-cooled model is ideal. All enclosed motors can be furnished in standard enclosed or explosion-proof construction rated 55 C rise.

Saves 20-30 seconds

REPORT on new shovel-crane standards:
(one in a series)



ALL OPERATIONS ARE COMPLETELY INDEPENDENT—
In addition to eliminating shifting time, *Independent-Travel* allows the operator to swing and hoist the load while traveling. Whether to save time or to jockey the boom around obstacles, the operator can swing the boom while his machine is travelling in either direction. This optional feature can be used with any front-end attachment.

MORE USABLE HORSEPOWER — Size for size, Link-Belt Speeder shovel-cranes utilize more of the engines' available horsepower. This bonus pays off in added power at the bucket teeth, greater line pull plus extra power to swing, hoist and travel. Although it gets more usable power and line pull out of the same engines used in other shovel-cranes, a Link-Belt Speeder remains well within the engine manufacturers' recommended operating speeds.



each machine move

Independent-Swing-and-Travel eliminates shifting from swing to travel . . . permits easy moves . . . encourages operators to work machines close to bank where horsepower is used to best advantage.

USERS of Link-Belt Speeder shovels and draglines are setting new high production standards by equipping their machines with *Independent Swing and Travel*.

Optional on 11 models, this feature eliminates time losses occurring when operators shift from swing to travel and from travel to swing. With *Independent Travel*, shifting is eliminated and the machine can swing and travel simultaneously.

Particularly valuable on pit operations

Not only does *Independent Travel* simplify the operator's job, it also conserves his energy . . . helps encourage him to push his Link-Belt Speeder to its exceptionally high limit—all shift long. Furthermore, because the operator knows he can move away from banks in less time than it takes to read this sentence, he's confident, aggressive. He stays in close to the bank, can operate with the attachment at the best digging angle.

Another way *Independent Travel* pays off is that the operator can immediately, effortlessly move his rig along the bank.

Speed, maneuverability, safety

Owners of machines equipped with *Independent Travel* report that this feature gives them a high percentage of work time spent in actual productive effort. What's more, they say it greatly decreases operator fatigue, keeps end-of-the-shift output at previously impossible high levels. In addition, because all operations are independent of each other (as shown in the illustration at left), the shovel maneuvers more readily in tight quarters and is able to move away from bank cave-ins in a split second.

Cuts maintenance bills

The design of *Independent Travel* calls for separate power trains, separate clutches, shafts, gears and bearings for swing and travel. As opposed to ordinary machines—which have but one power train to perform both functions and therefore have these components in almost constant use—the Link-Belt Speeder with *Independent Travel* separates the functions . . . divides total wear over two power trains. Life of shafts, clutches, gears and bearings is greatly increased.

This is but one of many reasons why Link-Belt Speeder machines are completely revising existing standards of high-speed, high-profit shovel-crane operations. Contact your Link-Belt Speeder distributor or write Link-Belt Speeder Corporation, Cedar Rapids, Iowa.



SIMULTANEOUS SWING AND TRAVEL

Independent Travel eliminates shifting from swing to travel, from travel to swing and provides completely independent control. And fingertip-operated Speed-o-Matic—the only true power hydraulic system—makes every shovel-crane movement fast, easy, positive. With a flick of the wrist the operator puts his machine through its paces. There is little, if any, end of the shift letdown.



LESS MAINTENANCE — Self-compensating hydraulic pistons automatically adjust the clutches . . . eliminate operator's daily clutch adjustments for heat expansion and normal lining wear. With Speed-o-Matic, hydraulic pressure does the job.

It's time to compare . . . with

LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls

Enter 1591 on Reader Card

ROCK PRODUCTS, July, 1957



The 101-SE is a highly portable plant. The frame is extra strong to hold rigid alignment of all equipment and drives. A rocker beam with full width axles supports most plant weight. Four wheels, each with dual tires, oscillate separately to compensate for rough terrain.

Big Production at your Fingertips with the New AUSTIN-WESTERN push-button controlled Diesel-Electric 101-SE

Here's a high output, mobile gravel plant that combines top efficiency with modern ease of operations and low maintenance. It is DIESEL-ELECTRIFIED, PUSH-BUTTON OPERATED—a triumph in crusher engineering.

All plant components except jaw and roll crushers are electrically operated in this closed circuit plant. All operations are powered with individual electric motors through short coupled V-belt drives, instantly controlled from the operator's platform. Chains, idlers, sprockets and clutches, normal cost items on mechanical plants, are eliminated.

Regardless of load, all components operate at peak efficiency at all times, delivering top production and

accurately sized aggregates. A single convenient push-button station controls the plant.

See your nearby Austin-Western distributor . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio, for illustrated booklet.

COMPARE . . . then you'll specify AUSTIN-WESTERN

Welded steel plate crusher frame for high strength without weight of cast steel frame.

Inclined positive-throw type vibrating screen.

All bearings are anti-friction type.

Machined steel toggle plate for absolute protection of crusher.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

AUSTIN-WESTERN
CRUSHING, SCREENING AND WASHING EQUIPMENT



BALDWIN-LIMA-HAMILTON
Construction Equipment Division — LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation
Hamilton • Loewy Hydropress • Madison • Pelton • Standard Steel Works

PEOPLE IN THE NEWS

(Continued from page 36)

Heads Texas Association



ALLAN F. CUNNINGHAM of F. M. Reeves & Sons, Inc., Pecos, Texas, was elected president of the Texas Aggregates Association at its recent annual convention in Galveston. He succeeds Grady O. Rogers, vice-president and general manager of Travis Materials, Inc., Austin, Texas. John Van Amburgh, Wesco Materials Corp., Dallas, was named vice-president; and Robert Pyle, Gifford-Hill & Co., Inc., Dallas, secretary-treasurer. Ray L. Cain was re-elected to the post of executive secretary.

Directors of the Association, in addition to Mr. Rogers, include D. C. Harper, Southwest Stone Co., Dallas; L. Ed Lee, Fordyce Gravel Co., Corpus Christi; Noble W. Prentice, Lone Star Materials, Inc., Austin; Hudson Ingram, Acme Gravel Co., San Antonio; and Roy P. Eastland, Jr., Texas Sand and Gravel Co., Inc., Amarillo.

Elected Treasurer

LEONARD P. CONNOLLY has been appointed treasurer of Hercules Cement Corp., Philadelphia, Penn., to succeed Charles H. Noble, Jr., who has retired. George M. Harbison was named controller.

Sales Manager

WILBUR M. TOMLINSON has been named sales manager of the Kansas City territory of Universal Atlas Cement Co., New York, N.Y., succeeding the late Harold J. Layden. A native of Winfield, Kan., Mr. Tomlinson attended Oklahoma A. & M. College, Stillwater, Okla. He joined Universal

Atlas in 1928 as sales representative in Kansas City. In 1953 he was promoted to assistant sales manager.

Assistant to President

JOSEPH C. SMITH has been appointed assistant to J. O. Kamm, president of The Cleveland Quarries Co., Amherst, Ohio. He has been serving as a sales representative for the past two years.

Named Vice-Presidents

J. R. DOOLITTLE has been named vice-president of the crushed stone division of Canada Crushed and Cut Stone Ltd., Hamilton, Ontario, Canada, and R. K. Cunningham has been appointed vice-president of the cut stone division.

On Board of Directors

WILLIAM S. ZIEGLER, executive vice-president, Inland Cement Co., Edmonton, Canada, has been appointed to the board of directors.

Vice-President and General Manager of Limestone Co.



C. W. COBB has been named vice-president and general manager of Batesville White Lime Co., Batesville, Ark., in addition to his duties as vice-president and general manager of the Arkansas Limestone Co. He succeeds R. R. Ruetschi as general manager. Mr. Ruetschi has accepted a position with the Diamond Alkali Co., Cleveland, Ohio. A native of Hot Springs, Ark., Mr. Cobb joined the company in 1948 at Batesville. One year later he was appointed superintendent of the Myersville limestone quarry. When Arkansas Limestone Co., a subsidiary of Batesville White Lime Co., was formed in 1951, Mr. Cobb was elected vice-president and general manager.

(Continued on next page)

A COMPLETE REFRACTORIES SERVICE...

for Rock Products

Whether it's a portland cement plant, a lime plant, a gypsum plant, or a kiln for burning dolomite and magnesite—we can supply all of your refractory requirements.

Here are some Grefco refractories which should prove of particular interest to you:

RITEX MAGNESITE BRICK

— a patented, chemically bonded basic brick for lining the burning zone of rotary cement, dolomite and magnesite burning kilns subjected to service too severe for high alumina brick linings. RITEX also has applications in many vertical (shaft) limeburning kilns.

STEELKLAD BRICK—a

RITEX basic brick with steel plates already attached. It may provide major savings in your operation.

HIGH ALUMINA BRICK—

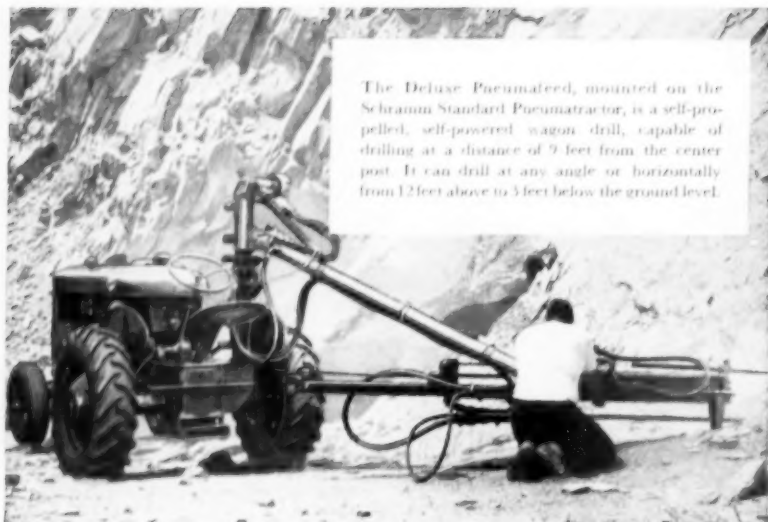
These come in a full line of shapes and sizes. ARCO-70 (70% Alumina) is most generally recommended, though brick ranging from 50% to 85% Alumina can also be furnished.

As part of our complete refractories service, we have developed cements, mortars, plastics and castables for the service conditions which have proved long-lasting and economical. They meet all the varying requirements of dry or wet application and cold or hot sets. Delivered in cans or bags of various weights.

GENERAL REFRACTORIES CO.
Philadelphia 2, Pa.



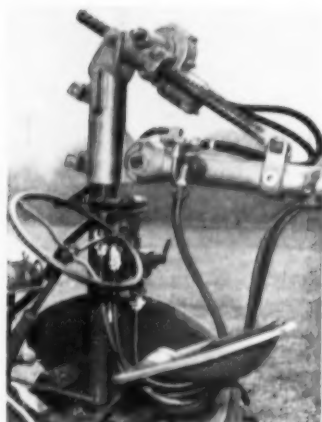
GENERAL REFRACTORIES



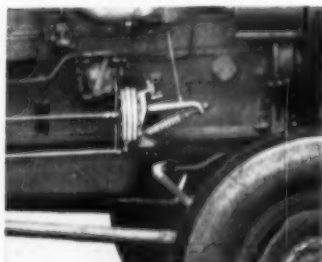
The Deluxe Pneumateed, mounted on the Schramm Standard Pneumatractor, is a self-propelled, self-powered wagon drill, capable of drilling at a distance of 9 feet from the center post. It can drill at any angle or horizontally from 12 feet above to 3 feet below the ground level.

A QUARRY OWNER DEMONSTRATES:

How to drill blast and toe holes at a new low cost



Air motor operated screw jack, mounted on post over rear axle, raises and lowers 8-foot boom. Standard model is hand cranked.



The Pneumastat, a Schramm exclusive, automatically controls the speed of the engine and compressor in accordance with air demands, saves fuel.

Enter 1510 on Reader Card

Putting compressed air to work on the job has never been easier or more economical. The operator merely climbs into the seat of his tractor type self-propelled air compressor and drives a complete air compressing plant right up to the job. No other equipment or labor is involved.

The outstanding example of this latest trend in portable air compression equipment is the Schramm Standard Pneumatractor—a gasoline engine driven 125 cfm air compressor with tractor features. It's a rugged machine, built to stand the daily abuse of quarry work. The Standard Pneumatractor can push, pull, provide mechanical power and compressed air for operating a variety of auxiliary equipment.

The cost of the Standard Pneumatractor is low; you get the use of a 125 cfm air compressor plus a tractor for less than the cost of many conventional two wheel mounted compressors alone. It's cheaper to operate and maintain, too. Any engine service man can service the Pneumatractor with very little instruction.

Complete details of this versatile machine are yours for the asking. Request Catalog 5545. Or ask your local Schramm dealer for a demonstration—he's listed in the Yellow Pages of your Telephone Directory.

Schramm, Inc.

MANUFACTURERS OF AIR COMPRESSORS

645 North Garfield Ave. • West Chester, Pa.

PEOPLE IN THE NEWS

(Continued from preceding page.)

Technical Director



DR. E. HOGNESTAD has been appointed technical director of Marquette Cement Manufacturing Co., Chicago, Ill. Formerly manager of the structural development section of the Portland Cement Association, Dr. Hognestad succeeds C. E. Wuerpel, vice-president, who has assumed general administrative duties, which include the supervision of all technical operations.

An internationally recognized authority on structural uses of concrete, Dr. Hognestad was born in Norway and graduated from the Institute of Technology in Norway with a degree in civil engineering. He came to the United States in 1947 and was appointed to the staff of University of Illinois in the School of Theoretical and Applied Mechanics. In 1952 he was awarded his doctorate in theoretical sciences by the Institute of Technology in Norway and subsequently joined the staff of the Portland Cement Association. Dr. Hognestad received a research prize from the American Society of Civil Engineers in 1955 "in recognition of outstanding work in research on structural concrete." He is also one of the co-recipients of the Leonard C. Wason Medal of the American Concrete Institute.

Division Purchasing Agent

ROBERT A. ENGELHARDT has been appointed purchasing agent of the Michigan Limestone Division, Detroit, Mich., of U. S. Steel Corp., Cleveland, Ohio. He succeeds F. G. Corrigan, who has retired after 35 years of service. Mr. Engelhardt joined U. S. Steel Corp. in 1935 and one year later transferred to the Pittsburgh Limestone Corp., a predecessor of the Michigan

(Continued on page 47)

Announcing **HI-CAP***...

New Du Pont Explosive

designed for economy in
blasting operations

Hi-Cap... the newest addition to the Du Pont explosive family... will assure economy in many blasting operations.

The reason is simple. Hi-Cap answers the demand for a low-priced, cap-sensitive, water-resistant explosive with high strength for all-around shooting.

Hi-Cap is available in 12½ and 25 lb. bags for pouring into small diameter dry holes and in 23-G cartridges of 5" diameter and above.

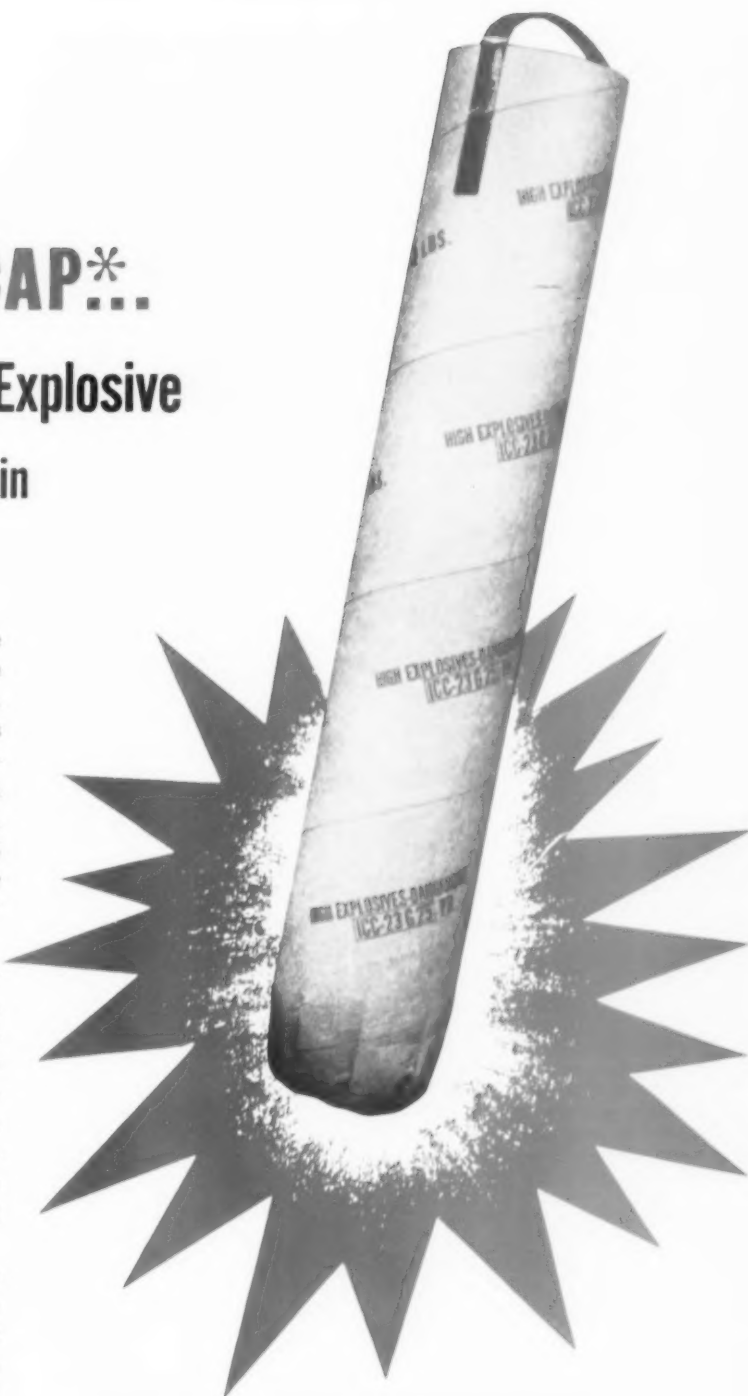
When Hi-Cap is poured in small diameter holes, a 40% dynamite primer, 1¼x8, is recommended for detonation.

For maximum safety, charges of Hi-Cap should be detonated with Primacord in the usual manner using Du Pont MS delay connectors whenever practical. With this method of firing, you have no blasting caps on the job until the shot is ready to fire.

Notice how the 23-G cartridge is crimped to facilitate loading in the hole. The tape bail serves as a carrying handle, and also for lowering. Since no outside case is required for the 23-G cartridge, there is no packing material or debris left to clean up after the shot is loaded.

Call your Du Pont representative for more information on low-priced Hi-Cap or write: E. I. du Pont de Nemours & Company (Inc.), Explosives Department, Wilmington 98, Delaware.

*Registration applied for



DU PONT EXPLOSIVES

Blasting Supplies and Accessories



BETTER THINGS FOR BETTER LIVING... THROUGH CHEMISTRY



Shovel-loading big-chunk rock into Dumptor — square body opening provides 64 square feet of target for easy loading over the side, or either end. It's the heavy-duty hauling unit with a ton of strength for every ton of payload capacity!



Plenty of power on the haul — (check high ratio of H.P.-to-loaded-weight in Dumptor story on next page). Dumptor also travels at same speeds in either direction for fast, no-turn shuttle hauling.



One-second gravity-dump speeds haul cycles. Dumptor has no troublesome body hoist, no hoist maintenance. Gravity-dump never balks, and never wears out.

IN ROCK LIKE THIS

you need Dumptors

When you are loading $1\frac{1}{2}$ to $2\frac{1}{2}$ yards of rock at a single pass, hauling units need plenty of strength to last. With Koehring heavy-duty Dumptor, there's a ton of strength for every ton of payload capacity. *It's built for rock.* Sides and ends of all-welded 6-yard body are heavily rib-reinforced. Double-plate bottom, lined with multiple steel beams, cushions the shocks of rock loading. Bolted or free-swinging kick-out pan adds another $\frac{1}{2}$ " steel plate to Dumptor bottom for extra strength.

There's plenty of strength, too, in the heavily-trussed chassis to take constant pounding of heavy loading and rough, off-road hauling. What's more, Dumptor has no leaf springs — just one big snubber-type chassis spring on the steering axle — none on the drive axle. Big drive tires eliminate the need for more springs, absorb loading and hauling shocks — save spring maintenance.

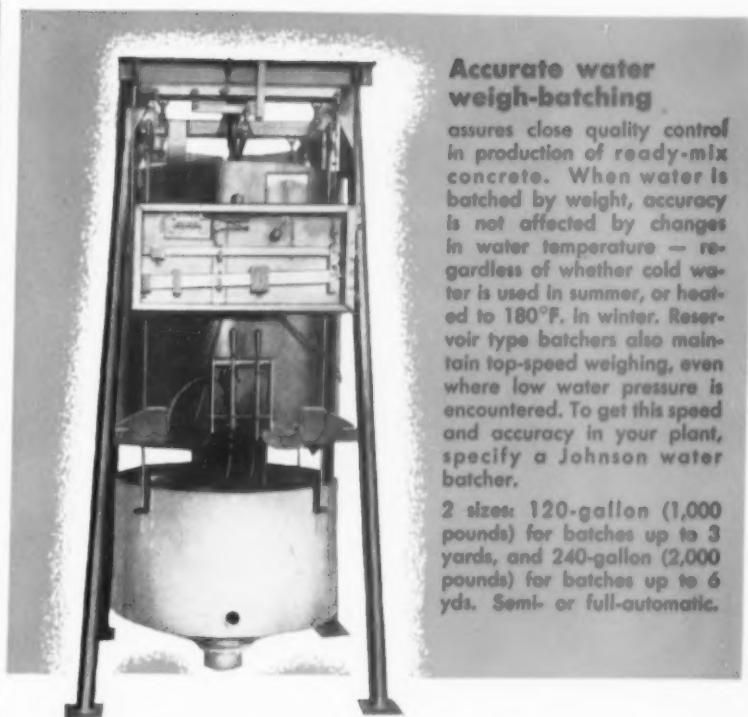
Even with all this heavy-duty strength, Koehring Dumptor® still has more than 6 H.P. for every ton of loaded weight. It accelerates fast, pulls through soft ground with less shifting, climbs 24% grades fully loaded. If you have a tough hauling problem, see your Koehring distributor about this heavy-duty 6-yard Dumptor. Why not call him now?

KOEHRING COMPANY

MILWAUKEE
16
WISCONSIN
CK642



Subsidiaries:
JOHNSON
PARSONS
KWIK-MIX

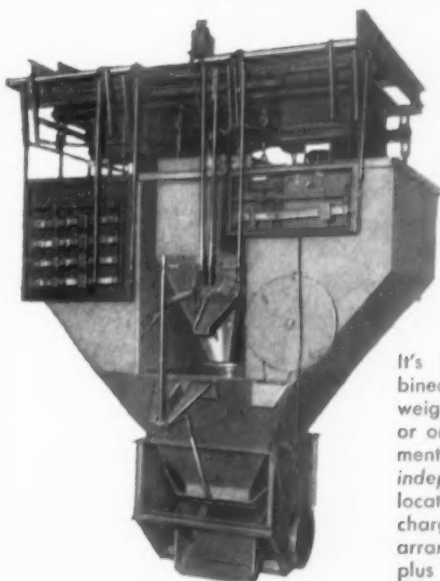


Accurate water weigh-batching

assures close quality control in production of ready-mix concrete. When water is batched by weight, accuracy is not affected by changes in water temperature — regardless of whether cold water is used in summer, or heated to 180°F. in winter. Reservoir type batchers also maintain top-speed weighing, even where low water pressure is encountered. To get this speed and accuracy in your plant, specify a Johnson water batcher.

2 sizes: 120-gallon (1,000 pounds) for batches up to 3 yards, and 240-gallon (2,000 pounds) for batches up to 6 yds. Semi- or full-automatic.

2 WAYS to increase batching efficiency



Central cement-feed

prevents "gumming", reduces dusting, and pre-shrinks materials. You get this unique advantage with Johnson Concentric batcher, because the aggregates are arranged concentrically around the cement. All ingredients are intermingled as they flow through discharge.

It's two separate batchers combined in one unit. Aggregates are weighed on accumulative dial scale, or on individual beam scales. Cement is weighed separately on an independent scale in a centrally-located, sealed hopper. Dual discharge available. Sizes: 2 to 8 yds., arranged for 2 to 8 aggregates, plus 1 to 4 types of cement. Manual, semi- or full-automatic operation.

Want more facts?

mail to: C. S. JOHNSON CO., Champaign, Ill. (Koehring Subsidiary)

Send us literature on: ☐ Water batchers ☐ Concentric batchers

NAME _____ TITLE _____

COMPANY _____

STREET _____

CITY _____ STATE _____ ZIP _____



Enter 1548 on Reader Card

*New from
Heil!*

**head-mount
telescopic hoist...
for greater
legal payload!**



- 1** *Extra-long cylinder sleeve overlap for perfect alignment during the dump cycle.*
- 2** *Chevron-type packing rings hold maximum hydraulic pressures safely.*
- 3** *Wiper Rings guard packing and cylinder walls from scoring.*
- 4** *Spherical bearing base mounting of cylinder prevents side strain on cylinder sleeves.*
- 5** *Hydraulic inlet located at top of cylinder eliminates possibility of oil loss through control valve.*
- 6** *Manganese bronze bearings throughout assure smooth, trouble-free action and long life.*
- 7** *Plunger-type control valve is fully balanced, with snap-in control positions, integral pressure relief and check valves.*
- 8** *High-pressure Heil Perma-Pump, mounted in-line with power take-off, delivers dependable lifting capacity.*
- 9** *Complete hoist frame is part of unit, actually reinforces truck frame, provides simple, low-cost*

mounting on any truck; no fixed projections below top of truck chassis.

- 10** *Wide hinges and large-diameter hinge through-shaft assure stable dumping action with heaviest loads.*
- 11** *Two types of easy-acting lever controls available, plus finger-tip torsion bar tailgate release mechanism.*
- 12** *Air vent at cylinder top vents air from cylinder with finger-tip action—no wrenches required.*
- 13** *Cast steel external packing glands reinforce cylinder sleeve ends and protect from "flaring."*
- 14** *New standard SAE "0" ring and 37° flared pressure fittings instead of conventional pipe thread fittings in all pressure lines.*

Ask for Heil advanced-design dump bodies and hoists. The Heil name plate is your assurance of a dependable hauling unit—with engineered features for money-making performance on the toughest earth-moving or quarrying operations.

THE HEIL co.

MILWAUKEE 1, WISCONSIN

DUMP BODIES and HOISTS

Enter 1546 on Reader Card

PEOPLE IN THE NEWS

(Continued from page 42)

Limestone Division, where he served in various capacities until 1951 when he became chief clerk in the purchasing department. In 1952 he was appointed buyer and in 1956 became assistant purchasing agent. Mr. Engelhardt, native of Pittsburgh, attended Carnegie Institute of Technology.

Director of Purchases

EUGENE SMELLIE, formerly assistant superintendent of plants, Huron Portland Cement Co., Detroit, Mich., has been promoted to director of purchases, according to an announcement by H. Ripley Schemm, vice-president in charge of operations. A graduate of the University of Michigan, College of Business Administration, Ann Arbor, Mich., Mr. Smellie will be responsible for all purchasing activities of the company.

P.C.A. Engineer

ROGERS E. ENSLEN has been appointed district structural engineer in the Birmingham, Ala., office of the Portland Cement Association, Chicago, Ill. Associated with the P.C.A. since 1946, he has been serving as field engineer for southern Alabama and will be succeeded by Dan Brock, a new member of the staff.

OBITUARIES

Agostino Carloni, founder and president of the Corlett Sand and Gravel Co., Cleveland, Ohio, died April 27. He was 68 years old. A native of Italy, Mr. Carloni came to the United States in 1913 and five years later founded the sand and gravel firm.

Bernard Pratt Bogy, co-founder of the Missouri Portland Cement Co., St. Louis, Mo., died May 4. He was 90 years of age. Mr. Bogy served as a director of the company from 1900 until his retirement in 1951. He was the grandson of the late Lewis V. Bogy, former United States Senator, and a direct descendent of Pierre Lacledé, a founder of St. Louis. Mr. Bogy was educated in St. Louis public schools and at Washington University, St. Louis, Mo.

Glenn A. Dymond, retired superintendent of the Batavia Washed Sand and Gravel Co., Inc., Batavia, N.Y., died April 30 at the age of 66.

END

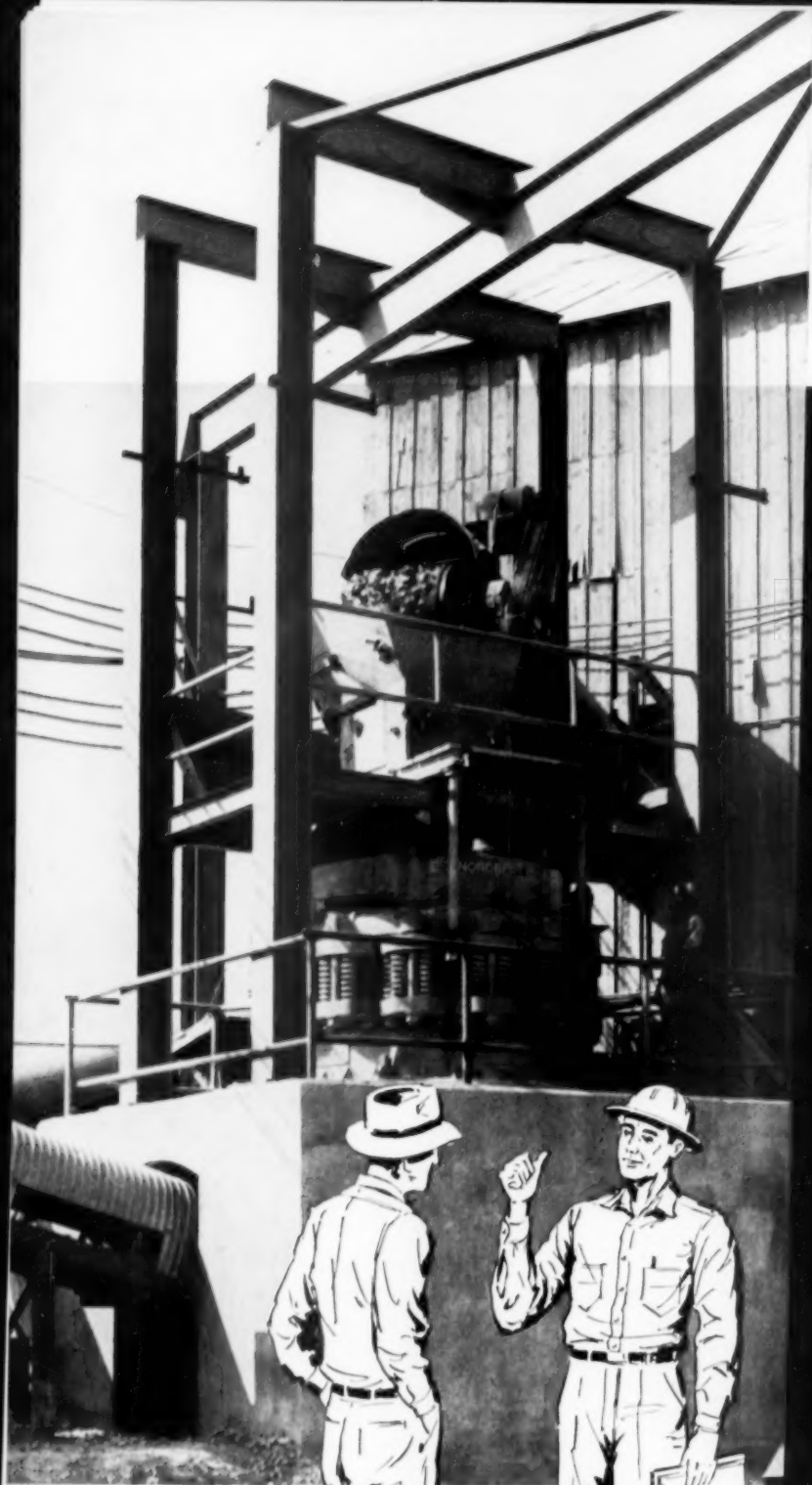
MEET SIZING SPECS

1. The GILSON Testing Screen is the standard sizing control of the industry. Engineers specify it. Contractors use it to check aggregates at the job site.
2. Progressive producers have been using the GILSON Screen for fifteen years. It's fast and accurate. It takes a beating, stays fast and accurate after years of hard, continuous use.
3. What about you? Are you going to get your share of the \$33-billion highway program? With the GILSON Testing Screen you'll meet sizing specifications with minimum time, labor, and cost.
4. The GILSON Screen makes two to seven separations simultaneously — 4-inch to 200-mesh — in five minutes or less per complete test. Field reports show that a GILSON Screen purchased now will serve you at least ten years under the most severe operating conditions, and with practically no maintenance.
5. Write for complete information. Do it now.



GILSON SCREEN CO.

MALINTA, OHIO



**You Get
Increased
Productivity
at Lower
Ton-Hour
Crushing Cost
by using
SYMONS®
CRUSHERS
all the way**

SYMONS . . . a registered Nordberg trademark
known throughout the world.

NORDBERG MFG. CO.

Milwaukee, Wisconsin

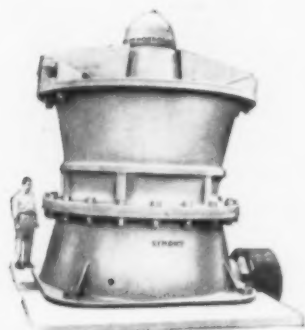
• Symons Crushers are designed and built to produce big tonnages of specification aggregate, bituminous mixes, sand and cement. Higher productivity at the lowest ton-hour cost are two of the sound operating advantages of Nordberg built crushers . . . from the Gyradisc® on up through Symons® Cones and Primary Gyratories.

Every one of these crushers is soundly engineered and ruggedly built to provide today's re-

quired performance. Good reason why they are the outstanding choice of leading producers and contractors in the construction of highways, dams and hydro projects, bridges, as well as commercial and residential buildings.

Consult Nordberg soon . . . it will pay you to specify and use Symons Crushers for both stationary and/or portable service.

Write for descriptive literature.



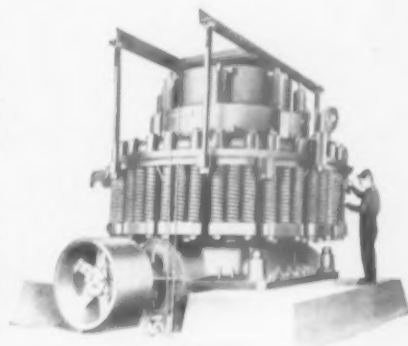
SYMONS 42" GYRATORY CRUSHER

SYMONS PRIMARY GYRATORY CRUSHERS

(Left): These gyratory crushers are built for big tonnage, heavy duty primary breaking in 30", 42", 48", 54", 60" and 72" feed opening sizes, for capacities up to 3500 or more tons per hour.

SYMONS STANDARD CONE CRUSHERS

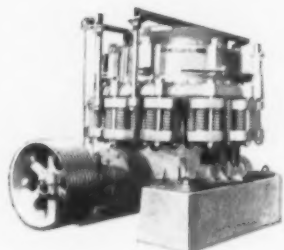
(Right): Standard Type Symons Cone Crushers are built for primary and secondary service in 6 sizes with crushing heads from 2' to 7' in diameter. Capacities in open circuit range from 15 to over 900 net tons per hour.



SYMONS 7' EXTRA HEAVY DUTY CONE CRUSHER

SYMONS SHORT HEAD CONE CRUSHERS

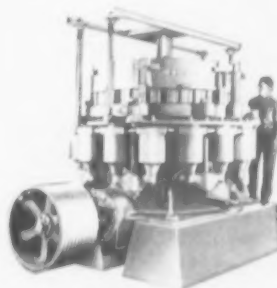
(Left): Short Head Type Symons Crushers are built for fine reduction. Offered in 5 sizes with crushing heads from 2' to 7' in diameter. Capacities up to 420 net tph in closed circuit operation, with greatly increased capacities in open circuit crushing.



SYMONS 4' SHORT HEAD CONE CRUSHER

GYRADISC® CRUSHERS

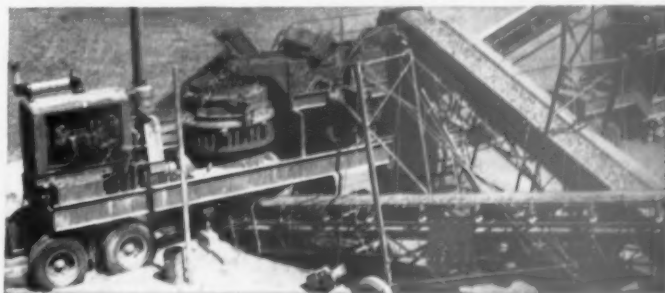
(Right): Built to supplement the Symons Cone Crusher, the 54" Gyradisc Crusher is providing volume production of still finer specification material, such as ag-lime, limestone chips, sand, rock dust, crushed stone for asphalt mix, and the fine reduction of asbestos and talc.



54" GYRADISC CRUSHER

FOR PORTABLE SERVICE

Increasing numbers of portable plant operators are now using Symons Cone Crushers for big capacity of fine product . . . such as the Cedarapids Model 4-ICS portable intermediate crushing plant utilizing a 4' Symons Cone Crusher, shown at the right.



© 1957, Nordberg Mfg. Co.

Q457



SYMONS VIBRATING GRIZZLIES



SYMONS VIBRATING SCREENS



NORDBERG GRINDING MILLS



NORDBERG KILNS, DRYERS, COOLERS

NORDBERG ENGINES,
10 to over
12,000 hp



NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • ST. LOUIS • DULUTH • WASHINGTON
TORONTO • MEXICO, D. F. • LONDON • GENEVA • JOHANNESBURG



Photo Courtesy Iowa Mfg. Co.

NEED MORE POWER FOR PRODUCTION?

You can get all the power built into your diesel and heavy-duty gasoline engines. Use a lubricant that meets their specific requirements . . . *Texaco Ursa Oil Heavy Duty*.

With *Texaco Ursa Oil Heavy Duty* your engines run smoothly and clean—delivering *more power with less fuel over longer periods* between overhauls. *Texaco Ursa Oil Heavy Duty* is carefully refined and de-waxed, and fortified with a number of special additives. These agents enable it to (1) inhibit oxidation, (2) assure full detergency and dispersion, (3) prevent rust, (4) protect bearings, (5) withstand high pressure and temperature, and (6) minimize wear.

Why waste your engines' power potential? Try *Texaco Ursa Oil Heavy Duty* today. Or better still, have a Texaco Lubrication Engineer analyze all your lubrication needs. Call the nearest of more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd St., New York 17, N. Y.

• **Texaco Regal Oil R&O** has been specially developed for air compressors and hydraulic equipment. It keeps systems clean, lines clear—assures dependable performance *always*.

• **Texaco Crater and Texaco Crater X Fluid** lubricate both wire rope and open gears. They keep the wire rope strong longer—protect the teeth of open gears.



TEXACO Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT

Enter 1550 on Reader Card

INDUSTRY NEWS

New limestone quarry goes into production

POUNDRING MILL QUARRY CORP., Roanoke, Va., recently opened an 80-acre quarry near Bluefield, Va. C. M. Hunter, Jr., vice-president and general manager, said that capacity of the new operation is 1,000 tpd., with production going as aggregate for concrete and road construction and as flux-stone for the steel industry.

A spur will be built to connect the Norfolk and Western Railway with the plant. Pending the completion of the line, the quarry will ship by truck. Part of the machinery and equipment installed at the quarry was purchased from the Oakvale Stone Corp., which is located in Princeton, W. Va.



One plant to serve two asbestos mines

ASBESTOS CORP., Montreal, Can., is enlarging the mill at its Beaver asbestos mine at a cost of \$5 million. It will process ore from both Beaver and King mines and is expected to result in appreciable operating economy. The Beaver mine and mill were closed in June to enable the addition to the plant to be carried out. The project is slated for completion by the middle of 1958, said A. L. Penhale, president and managing director.

Dedication ceremonies mark Cushenbury plant opening

SOME 1,100 BUYERS, users and distributors of portland cement, contractors, architects, state, county and city officials and members of the press

attended dedication ceremonies marking the opening of the Cushenbury plant of Permanente Cement Co. May 15-16. The plant is located in the Mojave desert near Lucerne Valley, California.

Sell gravel firm

LAKEVIEW SAND AND GRAVEL CO., Lakeview, Ore., has been sold by Mr. and Mrs. Jack Moffitt to George Jackson, formerly of Shady Cove, Ore. No change in operations is anticipated by Mr. Jackson, and the firm will continue under its present name.

The dedicatory program was conducted by Eugene E. Trefethen, Jr., executive vice-president, Kaiser Industries Corp., in the place of Wallace A. Marsh, vice-president and general manager of Permanente Cement Co., who was unable to attend. Peter S. Hass, vice-president and assistant general manager, was master of ceremonies at the dedication, and Mr. Trefethen was principal speaker.

Third Solite plant on Virginia-N. Carolina border



SOUTHERN LIGHTWEIGHT AGGREGATE CORP., Richmond, Va., dedicated its third Solite plant June 1 at Leaksville Junction, Va. The new plant will bring total production of the lightweight aggregate to more than 1,000,000 cu. yd. annually.

The new plant was built on the Virginia-North Carolina state line. Most of the machinery and equipment are in Virginia, and the quarrying operation lies in North Carolina. Solite plants are also in Buckingham County, Va., and in Stanley County, N.C.

In his talk Mr. Trefethen outlined the history of the Kaiser organization. "Now, after more than 40 years," he said, "Kaiser Industries Corporation and its affiliated companies have total assets of close to \$1 billion, total sales of close to \$1 billion annually, 69,000 stockholders, 60,000 employees and 89 plants and facilities in 14 states and 10 foreign countries."

He indicated that the past decade has been the period of greatest expansion, and that present expansion programs aggregate approximately \$540 million. He mentioned also Kaiser's contribution to social welfare through charitable trusts and nonprofit corporations comprising the Kaiser Foundation Health Plan, which has 530,000 members and is operating 12

(Continued on page 52)

INDUSTRY NEWS

(Continued from preceding page)

hospitals and 34 outpatient treatment centers as well as a school of nursing.

The dedication ceremonies and barbeque lunch were held in the open yard of the Cushenbury plant. Carl B. Stibolt, director of public relations for Permanente Cement Co. and his staff were responsible for the smoothly conducted affair. With Mr. Stibolt were Frank Crosby, manager of public relations for Permanente Cement Co., Phil Harrigan, Los Angeles public relations officer for Permanente and Kaiser Gypsum, Alex Trofey, press officer for the Kaiser interests, John Hickman, assistant advertising manager for Permanente, and R. S. Bateman, public relations director for Kaiser Engineers, Inc.

Gypsum plant nears readiness

CELOTEX CORP., Chicago, Ill., has scheduled its \$6 million gypsum products plant near Fort Dodge, Iowa for midsummer completion. The plant will occupy 150,000 sq. ft. of floor space, and will be supplied by gypsum quarried from an 880 acre site. Henry W. Collins, Celotex president, said that the plant will have a new mechanical-electrical compensating control system to insure quality control of products. Electrical dust collecting equipment has been installed, and other features are a high-speed lath punch machine that can run as much as 160 fpm., and an automatic bag flattener to compress bags of plaster and allow firmer loading. Enclosed dock facilities permit loading 25-30 freight cars per day.

Opens three plants

AMERICAN AGGREGATES CORP., Greenville, Ohio, announced opening of three new sand and gravel plants—in Dayton, Columbus and Indianapolis. Directors of the company voted a four percent stock dividend payable July 1 to common shareholders on May 24.

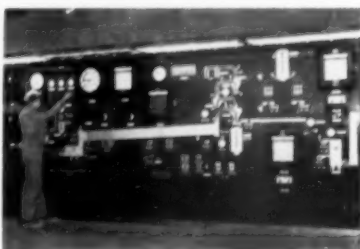
Film earthmoving operation

"Moving a Mountain into a Lake" is the title of a 17-min. color film which tells the story of conveying 30,000,000 tons of earth and rock in construction of a 13-mile roadbed across the Great Salt Lake for the Southern Pacific railroad.

Hewitt-Robins, Inc., manufacturer of the belt conveyor system, has prepared the film which shows how the operation is carried out. Interested

groups may borrow a print from the company headquarters, Stamford, Conn. A story in the January, 1957 issue of *ROCK PRODUCTS*, "Rock Fill to Replace Trestle across Great Salt Lake" was devoted to this project.

New kiln panels



HURON PORTLAND CEMENT CO., Detroit, Mich., has installed two pictorial instrument panels for new kilns 17 and 18. The panels were constructed by Leeds and Northrup Co., Philadelphia, and provide for automatic cooler temperature and pressure control, and automatic recording of kiln speed, exit gas oxygen analysis (two-point system), as well as miscellaneous temperatures in the kiln system.

Potash mine planned by International Minerals

INTERNATIONAL MINERALS & CHEMICAL CORP., Chicago, Ill., plans to open a potash mine in Saskatchewan, according to Louis Ware, president. Construction of the shaft is scheduled for completion by the end of the summer. Site of the new operation is a 450,000-acre tract about 150 miles east of Regina.

The potash mine at Carlsbad, N.M. has been operated at capacity, said Mr. Ware, and the new project will take care of expanding business. Reserves at the Canadian mine are sufficient to produce at more than twice the rate of their present mine.

Pavement yardage

AWARDS OF CONCRETE PAVEMENT for the month of April, 1957, and total awards for the first four months of 1957 are listed as follows by the Portland Cement Association:

	Sq. yd. awarded during April	First 4 Mos.
Roads	3,702,453	16,777,218
Streets and Alleys	2,941,469	7,830,324
Airports	1,171,850	7,182,230
Totals	7,815,772	31,789,772

Edwin H. Davis honored at dedication of bridge



Robert M. Patton, president of Davon, Inc., Edwin H. Davis, chairman of the board and treasurer, and William A. Rodgers, manager of Basic Construction Materials Division, shown at the bridge dedication

BASIC CONSTRUCTION MATERIALS, division of Davon Inc., (formerly New York Coal Co.), Columbus, Ohio, dedicated its new suspension bridge spanning the Scioto River near Chillicothe, Ohio, to Edwin H. Davis. The dedication ceremony coincided with the fiftieth anniversary of Mr. Davis' association with New York Coal Co. Now chairman of Davon's board of directors, Mr. Davis was honored for "50 years of loyal service and far-sighted leadership."

The 400-ft. suspension bridge is part of a half-mile conveyor system installed by Basic Materials to connect

a new gravel deposit with the processing plant across the river. The conveyor was scheduled for operation early this month, according to Robert Patton, president of Davon Inc.

Announcement of the firm's name change from New York Coal Co. to Davon Inc. was made a few weeks ago. It followed a decision by the board of directors who felt that the former name was misleading inasmuch as the company has relinquished its coal interests and is owned by Ohio capital. The new name incorporates parts of the names, Davis and Patton.

(Continued on page 34)



Illustration from Agricola's De Re Metallica (1521)

only the richest ores could be processed

Back when they had to be processed by hand, only the richest ores were refined. For—even though manpower was practically free—the methods were so crude that too much of the valuable metal was lost.

Today, ore bodies that were ignored only a few decades ago are being processed profitably. This is due in large part to efficient

grinding mills that turn out many tons of properly sized ore every day . . . mills that often utilize CF&I Grinding Balls and Rods. Always made from special analysis steel with the ideal balance between toughness and hardness, CF&I Grinding Balls and Rods assure optimum grinding ability and maximum wearability.

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ROCK PRODUCTS, July, 1957

53

INDUSTRY NEWS

(Continued from page 52)

Portland cement production

PRODUCTION OF FINISHED PORTLAND cement in February, 1957, as reported to the U. S. Bureau of Mines, totaled 17,860,000 bbl., a decrease of nine percent from February, 1956. Mill shipments for the month totaled 15,116,000 bbl., a decrease of five percent compared with February, 1956, and stocks on hand were 32,390,000 bbl., 12 percent more than on the same date a year ago. Clinker production in February, 1957 totaled 22,313,000 bbl., a decrease of four percent from the February, 1956 figure. The report was based on figures provided by 156 plants in 37 states and Puerto Rico.

Perlite Institute predicts sales exceeding \$15 million

PERLITE INSTITUTE, holding its eighth annual meeting in New York, predicted an industry uptrend. Sales of perlite should reach a new peak this year of more than \$15 million.

Representatives of 30 perlite-producing companies in 19 states attending the meeting elected two new directors to two-year terms: Lewis Staerker, sales manager of Southern Division of Tennessee Products and Chemical Corp.; and Lewis Williams, president of Perlite Industries of Arizona, Inc. The board of directors named Norman E. Braun, operations manager of The Cleveland Gypsum Co., to fill a third vacancy until 1958 annual meeting.

Featured speaker at the meeting was Dr. Tom Sheehan of University of Florida, one of five universities conducting investigations for Perlite Institute. He predicted a bright future for perlite as a soil conditioner and growing medium for rooting and starting seedlings in the ornamental horticulture market. Perlite, he said, provides plant life with ample nitrogen and oxygen, permits efficient drainage and lasts indefinitely.

It was also pointed out by Steve Williams, Tennessee Products and Chemical Corp., chairman of the Horticulture Committee, that research was proving perlite ideal for other agricultural purposes such as lightweight packaging and shipping material and bulb storage. The committee has voted to establish additional projects at two or more universities to study use of perlite as a carrier for herbicides, insecticides and other types of agricultural chemicals. A preliminary grant for this purpose has been awarded to Cornell University.

In his annual report, Richard S. Funk, administrative secretary, stated that in 1956, 63 percent of perlite produced by Perlite Institute members went into the plaster aggregate market; 19 percent went into insulating concrete for roof deck construction; and the remaining 18 percent went into manufacture of insulation board, gypsum wallboard, acoustical plaster and tile, pipe insulation and other products.

As a major item of business, the board appointed a committee to study more efficient techniques for building perlite concrete roof decks and to evolve effective ways of training selected contractors in utilizing these newer methods. Toward this end, said Mr. Funk, a 15-min. color film is being prepared for use by member plants.

Doubling potash production

AMERICAN POTASH & CHEMICAL CORP., Los Angeles, Calif., is adding equipment for granulating potash at its Trona, Calif., plant. The \$750,000 project is being done in two parts, the first now complete and the second half scheduled for completion by the end of the year.

The new facilities will double production capacity at the plant, according to Frank McGrane, sales manager of agricultural chemicals.

Modernization in final stages

LONE STAR CEMENT CO., New York, N. Y., announces that the modernization and expansion program at its Nazareth, Pa., plant is in its final stages. When finished late this year, five original kilns will be replaced by four modern 11 ft. 3 in. x 300 ft. coal-fired, dry-process kilns.

The dust recovery system consists of four new Research-Cottrell units, one for each kiln. The units include conditioning towers and combination mechanical-electrostatic precipitators, each designed to handle 120,000 cfm. of exhaust gas with an overall efficiency of 98 percent.

Precipitators and water-spray conditioning towers will be located on a concrete structure designed by the engineering department of Lone Star Cement Co.

Boosts wallboard output

UNION GYPSUM CO., Phoenix, Ariz., has installed new facilities, including a calcining kettle, at its gypsum products plant in Phoenix. The kettle will double the plant's calcining capacity, said H. B. McQuatters, president of the company. In addition, the firm is constructing a 60 x 340-ft. warehouse.

END

Coming Conventions

July 17-18, 1957—

National Crushed Stone Association, Mid-Year Meeting, Board of Directors, The Homestead, Hot Springs, Va.

August 25-31, 1957—

National Sand and Gravel Association, Semi-Annual Meeting, Board of Directors, Manoir Richelieu, Murray Bay, Quebec, Canada

September 9-12, 1957—

American Mining Congress, 1957 Metal Mining and Industrial Minerals Convention, Salt Lake City, Utah.

October 9-11, 1957—

National Slag Association, 40th Annual Meeting, Plaza Hotel, New York, N.Y.

October 15-18, 1957—

Society of Mining Engineers of A.I.M.E., Annual Meeting and Southeastern States Mining Conference, Hotel Hillsboro and Hotel Tampa Terrace, Tampa, Florida

October 17-19, 1957—

Empire State Sand, Gravel and Ready Mix Association, Annual Meeting, Lake Placid Club, Lake Placid, N.Y.



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and sizing operations,
and reduce costs...*

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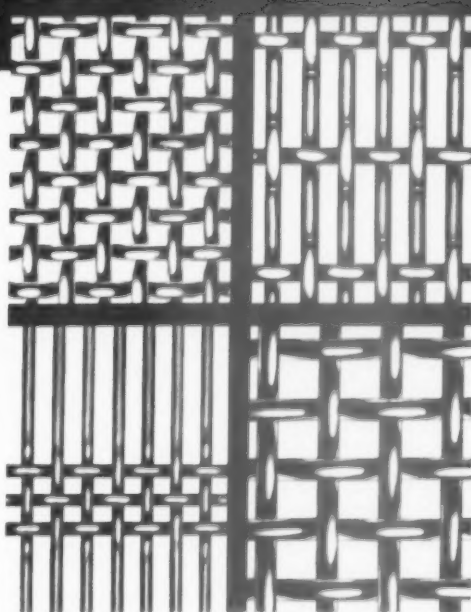
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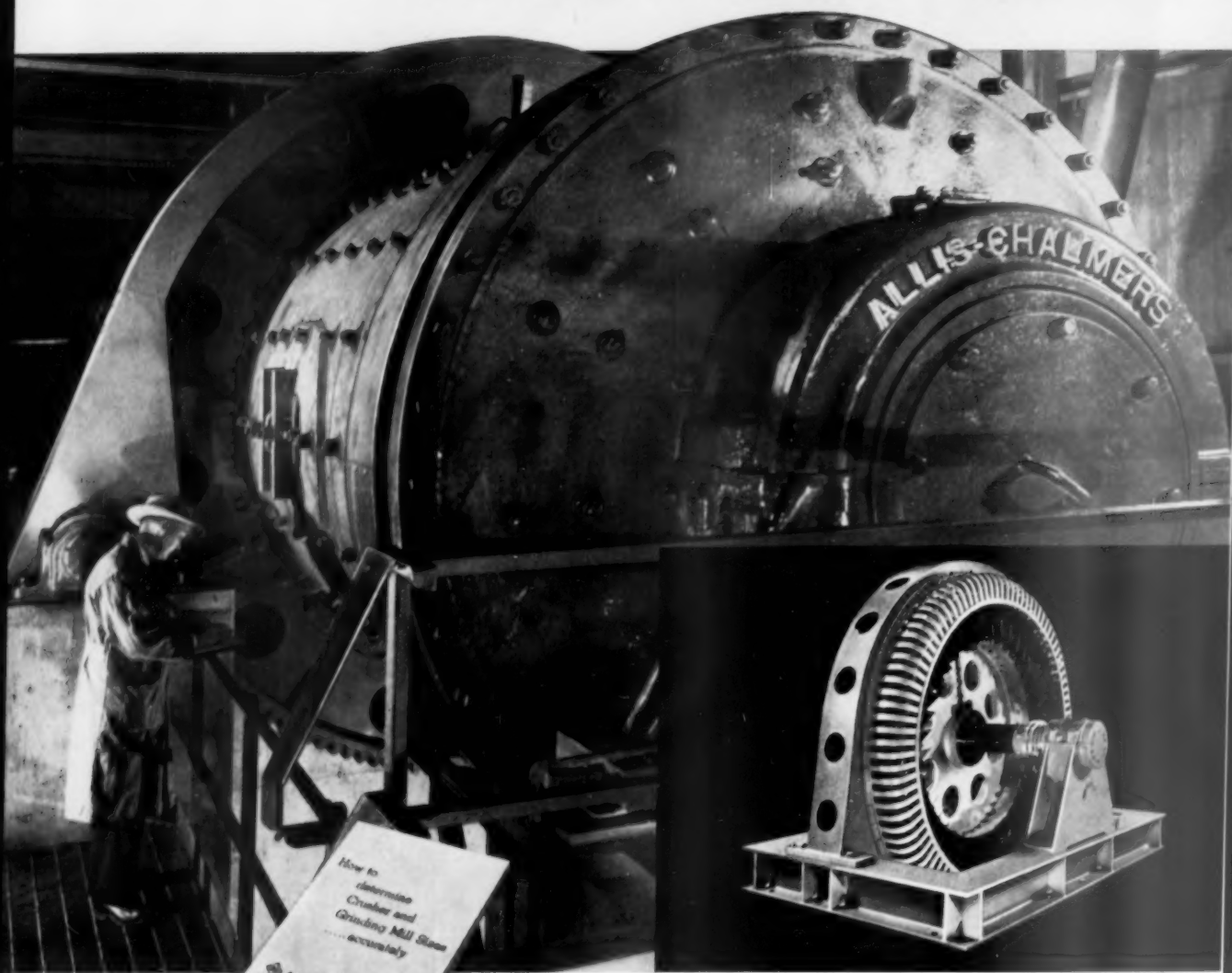


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This bulletin with its explanation of the "work index" formula enables you to evaluate any crushing or grinding operation . . . compare efficiencies of plants, circuits, and machines. Write for this valuable reference. It offers the only truly scientific method of determining the right machine — the only scientific approach to maximum production at lowest cost. Ask for Bulletin 07R7995. Individual bulletins covering specific equipment are also available.

Motors — Should a totally-enclosed or an open-type motor be applied? Is a synchronous motor needed for power factor correction? The right answers to these questions are important to you. By applying the "work index" formula, Allis-Chalmers engineers can determine the required power input and apply the right size motor needed for optimum efficiency. Familiarity with a wide range of cement and processing operations helps us apply the "work index" method to your equipment applications correctly.

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Correctly Applied

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Electrical Equipment for the Cement Industry**

Allis-Chalmers has long been recognized as a leading supplier of processing machinery for the cement industry. In fact more than 50% of the nation's cement is produced with A-C crushers, mills, screens and kilns. Allis-Chalmers is also one of the largest manufacturers of power equipment. *No other company* makes both the mechanical and electrical machinery for the cement industry. As a result, no other manufacturer has comparable facilities and experience necessary to apply and coordinate all equipment for a complete cement plant.

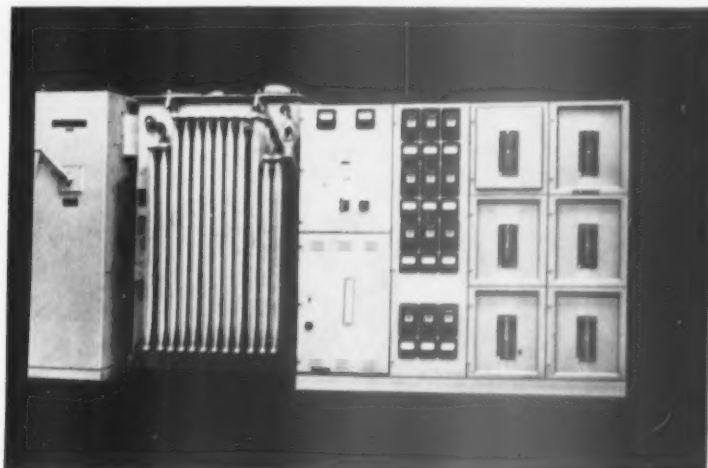
Industry's Top Technical Team at Your Service — Before a recommendation is made, require-

ments and variables are given a careful going-over by an Allis-Chalmers team comprised of research, design, manufacturing and application specialists from the electrical equipment and processing machinery departments. Characteristics of material, capacity, feed, preparation, balance of gradation, torque characteristics, system power factor needs are some of the many factors evaluated. Ideas and technical information evolving from this "meeting of minds" are then correlated in one department specializing in cement industry application. Components are matched to meet the requirements of your job. Responsibility for complete plant efficiency rests with one company.



Control — "Inching" a grinding mill is a push-button operation with synchronous motor control. Holding down the "inch" button rotates mill. The costly, time-consuming inconvenience of transferring from operating bus to inching bus is eliminated by using an automatic throw-over arrangement utilizing two high voltage air contactors.

Completely automatic and packaged pyro-processing control, with speed of feeder and kiln synchronized, is another recent Allis-Chalmers development.



Unit Substations — Allis-Chalmers LCS unit substations pay off in flexibility, ease of installation, maintenance, safety. Completely factory engineered incoming line units, transformer and low voltage switchgear combinations are coordinated and applied specifically for your distribution system. You get features such as breaker storage in the disconnected position in the unit, independent long time and instant trip elements on the breaker, dead-front circuit breaker construction.

CHALMERS



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The Big Fleets buy



Ford's Tandem Models go modern in a big way! GVW's up to 45,000 lb., GCW's up to 65,000 lb. Wide choice of engines and chassis components permit you to meet your type of hauling conditions.

Why? . . . because on-the-job performance and low operating costs prove FORD trucks cost less

Take a tip from the men who buy trucks every year. Official truck registration data shows that owners of America's biggest commercial truck fleets are buying more Ford trucks than any other make!

Contractors and suppliers, engaged in heavy construction work, have found Ford trucks are best for their fleets, too. To begin with, Ford's

initial costs are low. Many models are priced below all competitive makes. For example, the new Ford Tilt Cab models are America's lowest-priced!*

And it costs less to run a Ford truck. Thanks to modern Short Stroke power and sturdy chassis construction, operating costs and "shop time" are reduced. Another important Ford plus is longer truck life—a fact certified by independent insurance experts.

Add it all up—you'll find Ford trucks do cost less! Contact your Ford Dealer . . . let him show you why the big fleets are buying more Ford trucks than any other make.

*Based on comparison of manufacturers' suggested retail prices

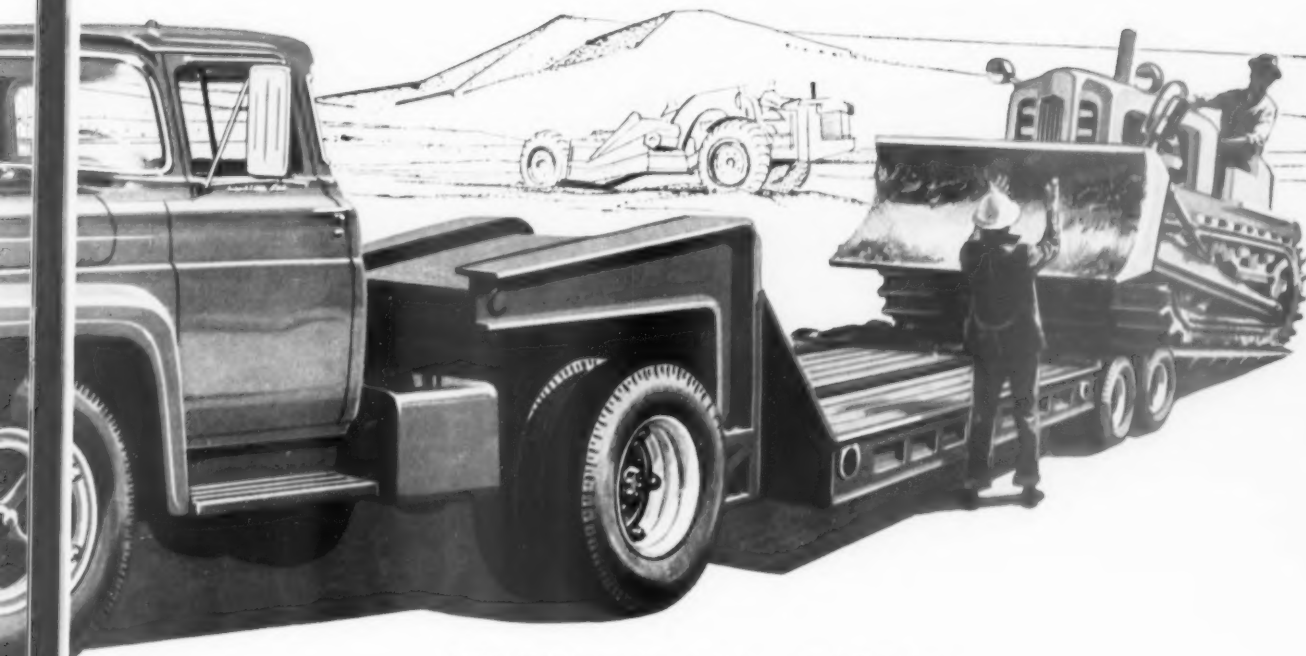
FORD TRUCKS COST LESS

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LAST LONGER, TOO!

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Ford's Big Jobs are heavy-duty throughout. New, more durable engines. New stronger cabs and chassis. Up to 45,000-lb. GVW, GCW's up to 60,000 lb.

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Boise, Idaho

HINTS

AND HELPS

Profit-making ideas developed by operating men

Send Us YOUR Ideas

We would like to make this column better, and we can, with your help. In the past, we have depended upon our field editors almost exclusively for *Hint and Help* items. However, we feel that a wealth of material exists that only you can uncover. YOUR *Hint and Help* ideas, no matter how simple (in fact, the simpler the better) may interest other readers. For each idea accepted, you may receive either a cigarette lighter engraved with your name or \$5.00. A photograph or rough drawing should accompany each item. Send ideas to:

Hint and Help Editor
ROCK PRODUCTS
79 West Monroe St.
Chicago 3, Ill.

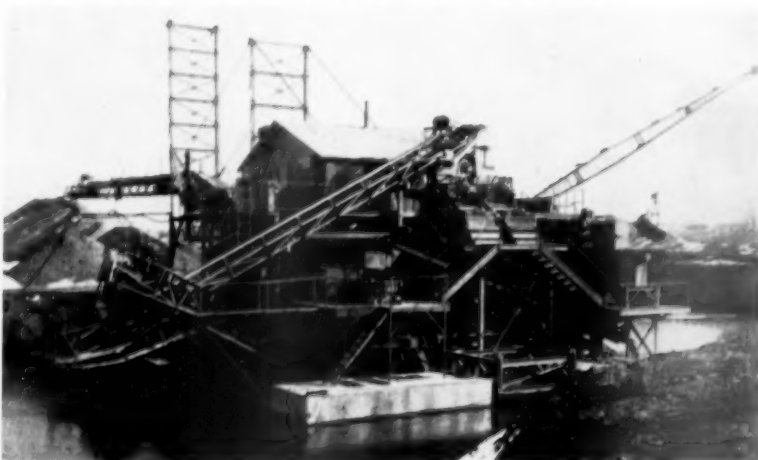
Silo can be dismantled, rebuilt



THESE STEEL BINS not only give a neat and trim appearance to this western sand and gravel plant, but were designed to be dismantled whenever the deposit is depleted. Each silo can hold about 270 tons of material and arranged in a straight line over the reclaim belt makes a clean cut and efficient system.

While the structural steel, platforms and conveyor frames are very substantial, they too have been designed for easy dismantling at any time.

Belt conveyors incline steeply to save space



ONE OF THE CONTINUING QUESTIONS of producers in the rock products industries is "How steeply can belt conveyors be inclined?" Closely pressed to save space this operator tried belts inclined 6 in. per ft.

The belt is not ribbed and travels at normal speed. The secret of success, however, is in the crushed, sharp, damp sand conveyed, which is damp enough to tend to stick to the belt yet not wet enough to flow back.

Underground man-way prevents undue exposure

IT GETS PLENTY HOT in the desert in addition to the normal heat around cement kilns so that this western cement producer put all his pipes, wires and conduit in a full-size man-way. This oval culvert not only gives protection and access to service this equipment, but access to both ends of the kiln without undue exposure for the operators.



Ribbed conveyor belt

WASHED SAND OR GRAVEL or aggregates which have become wet from rain or snow on storage piles are difficult to handle on inclined belt conveyors. In fact, a small amount of moisture will often sluice sand or gravel back down a troughed belt. This condition can be prevented with this ribbed belt with integrally molded rubber chevrons. Naturally, any belt conveyor installation handling wet materials should have the drive pulley fitted with herringbone rubber lagging to assure efficient transmission of power.

Way to estimate inventory

THIS SCHEME is presented to those who may need a quick method of estimating the inventory of materials in an irregularly shaped stockpile. It is based on the fact that modern machine-made paper is so uniform in weight.

First, weigh a sheet of cross section

(Continued on page 64)



Rowe Construction Co., Bloomington, Illinois, uses the Model 374 Conveyor, one of many types and sizes of Barber-Greene portables.

The president of Rowe Construction Co. reports

**"Our next portable conveyor
will be another Barber-Greene"**

"We have given our Barber-Greene conveyor four years of hard service and its performance has been tops. We produce sand and gravel for highway departments and for our own use. So we move our plant three and four times a year. Towing our conveyor from job to job presents no problem at all. We just hitch it up to a truck and move out.

"And it was no big job to lengthen our conveyor from 51 to 60 feet. All we did was order a nine-foot intermediate section and bolt it into place. All carriers, returns and decking were already in place and aligned.

"With this kind of reliability and easy flexibility, we feel sure our next portable conveyor will be a Barber-Greene."

Straight-forward reports like D. H. Rowe's provide the proof of the superior performance and widespread acceptance of Barber-Greene conveyors. Handling coal, sand, gravel and other bulk materials, these versatile conveyors operate on a virtually automatic basis... cut labor costs substantially.



Not just portability, but road-ability is one of the many features that save time and money for the Rowe Construction Co.

Literature shows the many superior features of Barber-Greene portables. Write for your copy.

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Barber-Greene



AURORA, ILLINOIS, U.S.A.

CONVEYORS...LOADERS...DITCHERS...ASPHALT PAVING EQUIPMENT

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ROCK PRODUCTS, July, 1957

61



*High altitudes, narrow benches severely test this Michigan,
yet every day it loads*

400 tons of rock weighing 5,400 lbs per cubic yard

Up in the scenic Sapphire Mountains of southwestern Montana, Cummings-Roberts Company has one of the toughest rock-loading jobs you could find anywhere.

Part of the time, they blast and load coarse mountain-top granite . . . summer and early fall, they load fluorspar. No one needs to detail what a severe test the heavy, rough granite overburden gives to *any* loader. Fluorspar, however, is even worse. A heavy rock mineral, it weighs 5,400 pounds per cubic yard—over 850 lbs more per yard than in-bank granite (and 2,200 lbs more than pit-run gravel).

Proved by demonstration

Over the years, Cummings-Roberts has tried just about every kind of loader made. Last year to increase

efficiency, their Michigan distributor, Miller Machinery Co., Missoula, suggested a Model 175A Michigan Tractor Shovel. "Frankly," Cummings-Roberts officials told them, "we don't believe *any* rubber-tire unit can load the stuff, much less do the work day in and day out. But we'll give it a try."

Result? John Taber, General Superintendent, wouldn't let them take the Michigan off the job.

Heaped loading assures proper blending

Today, the 133 hp $2\frac{3}{4}$ yard Michigan handles *all* loading of the super-heavy fluorspar. Production, with trucks on 600 ft one-way hauls to crushing mill, averages 400 tons per 7-hour day. The fluorspar, incidentally, varies considerably in grade from place to place through-



out the mine. It must be blended to give the grade desired for shipment . . . and this assignment goes to the Michigan, too. Its 27 mph mobility is a vital asset on this scattered loading; trucks never wait more than a few minutes for loading service.

Strips granite overburden — 500 tons per day!

In late autumn and sometimes in spring, the Michigan strips the granite overburden. Output averages 500 tons per 7-hour day.

Downtime negligible

With all this rugged loading of super-heavy material, plus repeated back-and-forth maneuvering on narrow benches, plus continuous work at high 6,800 to 7,000 ft altitudes, the torque converter equipped Michigan has posted an excellent mechanical record. *To date, it has had only one minor breakdown!*

Also tows compressors, speeds other odd jobs

Operator Don Lindblom likes Michigan's power-shift transmission, says its bucket action is the best he's

ever worked with. "You can tip it back and fill it easily," he says. "I like the fact also that it takes only half-an-hour per day to refuel and lubricate." Foreman Waino Lindblom adds, "The Michigan has done a nice job for us! We particularly like its truck-like speed in moving from bench to bench." This mobility gives the Michigan some "spare time" to handle maintenance jobs scattered along 15 mi of mountain roads—cleaning rock rubble off benches so trucks and wagon drills can get through . . . hauling air compressors . . . digging culverts . . . even plowing snow.

Got a tougher job than this?

There may be a tougher materials-handling job than loading granite and fluorspar . . . but we're willing to bet a Michigan Tractor Shovel can do it faster, better, at lower cost than any other machine. To prove it, your Michigan Distributor will be glad to arrange a demonstration at your convenience. *You pick the jobs.*

**CLARK®
EQUIPMENT**

Michigan is a registered trade-mark of
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Construction Machinery Division
2481 Pipestone Road
Benton Harbor 33, Michigan
In Canada: Canadian Clark, Ltd.
St. Thomas, Ontario

HINTS AND HELPS

(Continued from page 60)

paper—plain paper will do but it's harder to work with. Then make a sketch TO SCALE of the outline of the base of the pile of material on the paper, and cut around the outline.

The area of the cut out will be in the same proportion to the area of the original sheet as the weight of the cut out is to the weight of the original sheet.

Hard surface roll test



A WEST COAST SAND AND GRAVEL operator uses a set of 40 x 20-in. Lippman rolls in his final reduction set-up. Since there are a number of welding and hardsurfacing rods available for this heavy service, this producer's engineer decided to make a comparative test on the same rolls.

Seven segments were marked off on each roll and a different hardsurfacing rod applied to each. While several manufacturers applied their rod for this experiment, most of the work was done by the maintenance welder of the producers. Altogether it took about 36 hours to apply about 100 lb. of rod to each roll and cost about \$1.35 per lb. of rod.

While practically all of the rods did a satisfactory job, the gravel producer was able to select a brand which seemed best for this application.

Boom-mounted drill keeps operator on top of job



THIS SELF PROPELLED MONSTER has a drill and operator's cab mounted on the boom. The rig is located on the floor of a quarry of a southern stone producer where it is used to drill rock for secondary blasting.

The cab and drill can move along the pivoted boom so the operator can be "on top" of his work at all times. All controls are in the cab and the operator can move the three-wheeled machine to any convenient spot.

Reclaim tunnel ventilation provided by culvert section



EVENTUALLY THE STOCK PILE will cover the end of this sheet metal reclaim tunnel, so this western cement producer rigged up a culvert section to provide ventilation.

The pipe is supported in the middle to prevent bending from the weight of material, and from the end to nearby structural steel to prevent twisting. A piece of wire mesh hardware cloth keeps out birds.

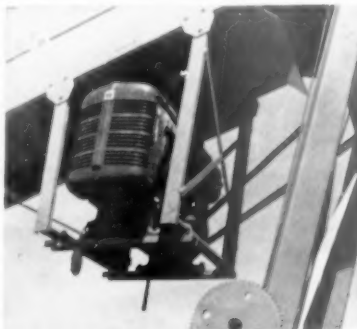
Sand meets specifications



A SAND AND GRAVEL OPERATOR had a deposit that was relatively high in sand, especially in the finer sieve sizes. He met this problem by installing a spiral sand classifier to recover a higher percentage of the final product.

Right next to the sand spiral he installed a sand drag which had been in use in another of his plants. The flow into these de-waterers was split and the result was that the drag collected a coarse fraction while the spiral picked up the finer sand. When the two fractions were blended continuously they produced a concrete sand that met specifications.

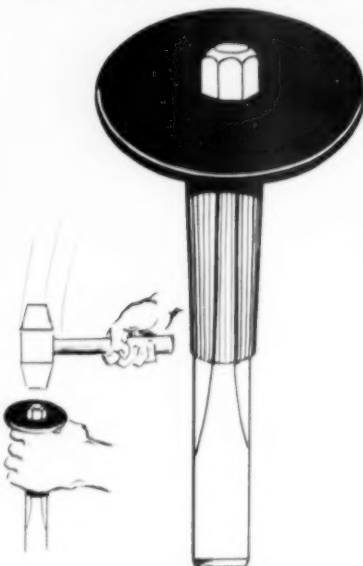
Suspended power unit



A MIDDLE WEST rock company displayed a bit of initiative when it suspended a 32.9-hp engine from the frame of a belt conveyor at one of its four crusher plants in the area. This "dangling" position reduces vibration and protects the unit from dirt and adverse weather conditions as well.

END

Cold chisel safety guard made of lightweight plastic



BREAKING A THUMB or pinching a finger when hammering a cold-chisel looks funny in a comic strip, but its no joke to safety-minded managers. Cold-chisels can now be fitted with lightweight plastic sleeves and hand guards. Result: no more pinched fingers, flying steel splinters or broken thumbs from tasks of this type.



Why Wyandotte Chemical Corp. chose this dozer (a *Michigan*)

"Like most quarries, we have a lot of widely-scattered, repetitive jobs to do," writes William Hagen, veteran manager of Wyandotte's big Alpena, Michigan, limestone quarry. "Trouble was, our crawler-dozers just couldn't handle 'em efficiently—moving, as they must over rocky surfaces, at only a couple of miles per hour. And the cost of track maintenance was pretty awful. Major cause of track wear is travel, of course . . . so we tried to limit *both* as much as possible by putting a crawler on each operating level and another on the stockpiles. Didn't help much, though. Breakdowns would still upset our schedules *several days per week*. So we decided to look at some rubber-tire dozers." They tried one type. It was unsatisfactory. Then Wyandotte's local Michigan Distributor, Michigan Machinery & Equipment Co., arranged an on-the-job demonstration.

Makes hour crawler move in 7 minutes

"From the moment our trial Michigan drove off the flatcar, it was *busy*," Hagen continues. "First job on the docket was leveling a dump area on our macadam storage pile. The Model 180 dozed enough area to last an 8-hour shift—in only 28 minutes! Then, because *two* of our crawlers were down for repairs

that day, we drove the Michigan a mile to our shovel loading area. *In less than 4 minutes* it was at work, cleaning up ahead of the 6 yard electric shovel and opening the way for trucks. Half an hour later, we moved back to macadam storage—a 3-minute trip this time. One of our crawlers would have taken a whole hour for the 2 mile round trip alone! Later, the Michigan assisted in moving our big quarry shovel; transfer of the power feed cable and area cleanup were handled faster than ever before. We also used the Model 180 Dozer to move drilling machines, air compressors and shanties . . . to strip shallow overburden . . . clean around the surge bin . . . maintain roads . . . and to level the flux stone stockpile. Nowhere in these operations did the Michigan have a bit of trouble. With performance like *this*, we were sold!"

Only 1 repair job in 5,800 hours

Hagen finds their Michigan today does all of these tasks and many more around this 450-acre quarry. The Model 180 actually works 16 hours a day, 7 days per week. Quarry Superintendent B. C. Raymond estimates its tire wear to be *1/6 as costly* as track maintenance on the crawlers. Its mechanical efficiency has been excellent . . . in the past year, it has

been down for repairs *only once*. Operators say "Michigan drives like a new car . . . avoids constant jarring of a crawler . . . gets us on the spot *fast* . . . has fine visibility fore and aft. *We like it!*"

Want to move in on bottlenecks too?

We'll bet a Michigan Dozer can break production bottlenecks for *you*, too. Won't cost you a cent to find out—your local Michigan Distributor will be glad to arrange a thorough demonstration. You pick the time. You pick the job. No obligation, of course. And ask him about the popular Clark Lease-Purchase Plan, which lets you put a Michigan to work without investing a penny of capital. Other finance plans available—choose the one you like best!

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Zoning is our biggest problem

"We must aim at the understanding and good will of communities in which our plants are located if we hope to avoid zoning laws and zoning regulations which do unnecessary violence to the economical operation of our plants."

By VINCENT P. AHEARN

The National Sand and Gravel Association and the National Ready Mixed Concrete Association, which Mr. Ahearn serves as Executive Secretary, have sought to create an enlightened understanding by the general public of the zoning problems of the sand and gravel producer and the ready-mixed concrete producer—an understanding which will serve their mutual interests and which is necessary if land is going to be dedicated to its highest use. Mr. Ahearn believes that unreasonable and unduly harsh zoning restrictions against the operation of sand and gravel plants and ready-mixed concrete plants will be avoided if the two industries carry out a well-balanced public relations program. He believes that an informed public in the communities where the plants are located will prevent disastrous zoning regulations and make it possible for the two industries to continue their indispensable contributions to the national economy.

The two Associations launched public relations programs designed to help the individual producer to inaugurate and maintain a program of good relations with people in his community. The article on public relations for the rock products industry appearing in our April issue drew largely on the work which these two Associations have done. **the editors.**

JUST OVER 30 YEARS AGO, the Ambler Realty Company sued the Village of Euclid, Ohio, because the village had set aside a parcel of land for strictly residential purposes. The realty company contended they had no right to do so. The Supreme Court of the United States agreed with the Village

of Euclid—and the concept of zoning was officially born and judicially baptized.

Although this decision had no direct connection with the rock products industries, its effect on these industries was so far-reaching that even now its full impact hasn't yet been felt. Without question, zoning is today the number one problem of the rock products industries. Ten years from now, the zoning headaches of today will seem child's play by contrast, if the move out of our cities continues at anything like the pace we see right now.

If we are to consider zoning realistically, we must first accept two rather unhappy facts. First, there is often a failure by the public to realize the great economic contribution which our industries make, with the result that zoning restrictions are adopted which make it difficult if not impossible for our plants to be operated. Second, zoning is here to stay. Regardless of how we feel about zoning, we must learn to live with it. Zoning authorities often overlook, in an excess of zeal, the fundamental principle that their function is to see to it that the proper interests of all are taken into account when a zoning regulation is enacted.

It is no longer pertinent to debate the second point. Since it is established well beyond our power to change it, we must rather concentrate on the first of these two facts. We must aim at the

understanding and good will of communities in which our plants are located if we hope to avoid zoning laws and zoning regulations which do unnecessary violence to the economical operation of our plants.

How important is zoning in our industries today? A survey was taken recently of the members of both the National Sand and Gravel and the National Ready Mixed Concrete Associations to determine the extent of zoning in the two industries. The surveys showed that 78.2 percent of the ready-mixed plants operate under zoning ordinances. A little more than half of the sand and gravel plants are restricted by the application of zoning performance standards and permit requirements. It can be expected that these percentages will grow steadily in the future.

Zoning *per se* is not necessarily bad. But punitive or unreasonable zoning is very bad—not only for the industries discriminated against but for the public as well. Such extreme zoning measures inevitably grow out of public antipathy or public misunderstanding. Therefore, if we are to prevent these things in the rock products industries, we must understand the principal public complaints against us—and then take positive action to satisfy them.

These complaints fall in five general areas:

1. **Dust and dirt, or air pollution.** It's difficult indeed to invoke a friendly feeling from a housewife who is hanging up her wash just as a cloud of dust settles over it from a near-by quarry, or to expect warm friendship from a householder who is washing his windows for the third time that month because of accumulated cement dust.

2. **Public eyesore.** One of the great shortcomings of the rock products industries is that they are not attractive **unless they are definitely made to be.** Since many proprietors haven't taken this step, public bad feeling is generated by the simple fact

that these plants detract from the beauty of the community. This feeling is in direct relation to the distance the viewer lives from the plant, with the severest criticism coming from the people in the immediate neighborhood.

3. **Noise.** Rock products operations don't have to be excessively noisy—but many of them are. The most persistent complaints come from noise at a time and place where the public has grown to expect peace and quiet—from night operations, for example, or from trucks operated through neighborhood streets.

4. **Safety.** Trucks operating too fast or moving along too slowly through crowded streets; dangerous spillage, dangerous and unprotected plant sites—these thing and a number of others constitute serious accident hazards and build a considerable amount of ill feeling.

5. **Unrehabilitated pits.** Perhaps the most serious threat to the rock products industries is the public eyesore and danger of worked-out pits, and the consequent loss of this land forever as practically usable industrial, recreational, residential or commercial sites. Producers in steadily increasing numbers, however, are realizing their duty to restore these unsightly areas, rendering them useful to others in the future.

Now, having examined the public attitudes that are likely to cause zoning difficulties, let's consider what can be done about them. Only by correcting these public impressions and changing, or at least mitigating them, can we make sure that we will get fair consideration when zoning restrictions are promulgated.

The first and most important step is the right attitude. The operator who is willing to seek public understanding and then do his best to operate within it has taken a long step toward good relations with the people who will sit on his zoning board. On the other hand, the operator who perpetually has a chip on his shoulder, who feels that he is constantly being discriminated against, and who reflects this attitude by being uncooperative with his neighbors and fellow townsmen is eventually going to pay for his attitudes. Producers have found that it is wise to conduct operations with a full regard for the public interest. It is enlightened self-interest to give full cooperation to people, organizations and government bodies in an effort to remedy any problems growing out of any particular phase of your operations.

Contrast the operator who says to a neighborhood committee of parents: "I can't afford to fence my property and you'll just have to keep your kids away from it," with the one who says: "Well, perhaps I can fence part of it, even though it's terribly expensive. Why don't you all come over and

Classification of plants in zoned areas in order of conformity

Location	Number of zoned plants	Conforming Number (percent)	Nonconforming Number (percent)
Industrial	151	133 (88.1 percent)	18 (11.9 percent)
Commercial	50	38 (76. percent)	12 (24. percent)
Rural	26	19 (73.1 percent)	7 (26.9 percent)
Semi-industrial	105	71 (67.6 percent)	34 (32.4 percent)
Suburban-residential	34	15 (44.1 percent)	19 (55.9 percent)
Urban-residential	32	12 (37.5 percent)	20 (62.5 percent)
Total	398	288 (72.4 percent)	110 (27.6 percent)

Zoning is our biggest problem

continued . . .

go around the property with me and we can talk it over." Which producer would you feel more kindly toward when zoning restrictions were being discussed?

The second important element in building good will is the development of long-range planning. A carefully prepared plan of land rehabilitation should be integrated with the plan of excavation. Our recent survey indicates that a significant portion of the sand and gravel industry is already living up to this important responsibility of intelligent land use.

Again, such a program is enlightened self-interest. There are many benefits, in addition to increased public good will and understanding, to be derived from an intelligent land rehabilitation program. There can be considerable derived tax benefits, and oftentimes it is even possible to show a cash profit after rehabilitating a piece of property. The American Aggregates Corporation—which has probably the most extensive land rehabilitation program in the nation—is consistently able to sell rehabilitated property (see photograph on this month's cover) for more than they paid for it originally.

Roughly, there are four major classifications of land rehabilitation:

Recreational—Use of the land for parks, swimming, fishing, boating or rod-and-gun clubs. Abandoned gravel pits are often adaptable to such uses, and thereby become attractive pieces of property.

Public construction—Often rehabilitated land is highly desirable for the construction of schools, reservoirs or similar public projects. And fre-

quently, the greatest return from such a piece of land will grow out of giving it to the city for the public benefit. Such a gift may pay rich dividends for many years in terms of good public relations.

Industrial and commercial construction—Reclaimed land may be ideally located for industrial or commercial development. As such, it can bring a fairly good price if it has been satisfactorily rehabilitated.

Residential—Encroaching residential growth is often the cause of zoning disputes. On occasion this may be turned into an advantage by selling rehabilitated land to residential builders.

Now, with the proper attitude and carefully worked-out, long-range plans, what immediate steps can be taken to counteract the four main sources of public complaint? Our surveys took up these problems at great length; our industries have shown a great deal of resourcefulness in attacking them. Here are some of the principal answers we received from the producers participating in our survey:

Minimizing dust, dirt and air pollution:

1. Enclosure of plant operations wherever it is at all possible.
2. Oiling, paving, washing down or treating with calcium chloride the roads and yards where trucks and other operating equipment are churning up dust and dirt.
3. Frequent cleaning of not only the yards but also the surrounding roads.
4. Washing down gravel and gravel cars more frequently.
5. Installation of dust collectors.

Plant location according to occurrence of zoning

Location	Number of plants	Number with zoning	Percent
Urban-residential	37	32	86.5
Semi-industrial	127	105	82.7
Industrial	185	151	81.6
Suburban-residential	44	34	77.3
Commercial	71	50	70.4
Rural	45	26	57.8
Total	509	398	78.2

Enhancing plant appearance:

1. Landscaping fringes of the property within public view.
2. Better housekeeping of both the plant and the yard areas.
3. Painting and better maintenance of plant building.
4. Enclosure of the plant or stockpile area, blocking public view.
5. Demolishing of old buildings that are no longer being used.

Noise abatement:

1. Better maintenance and inspection of trucks.
2. Installation of new mufflers on trucks.
3. Driver education on noise control.
4. Rerouting of trucks around areas complaining of noise.
5. Decreasing night operations.
6. Changing exhaust systems so the noise is projected up instead of behind the trucks.
7. Adjustment or improvement of noisy plant machinery.
8. Employee education to cut down on shouting, especially during the night and the early morning operations.
9. Prohibition of racing of truck engines.
10. Disciplinary action against chronic noise-making employees.

Safety:

1. Thorough driver education with heavy emphasis on safety—including an incentive program to keep truck drivers constantly safety-minded.
2. Strict limitation on truck speeds.
3. Rerouting trucks around residential areas.
4. More careful loading, thorough inspection, and easier operation around corners to prevent spillage.

5. Removal of mud and dirt from wheels of trucks before they pull on to city streets.
6. Self-policing and cooperation in a safe-driving, clean-driving program among local producers through a local trade association.
7. Complete or partial fencing of property, combined with a neighborhood education program to minimize accident hazards.

These are a few of the things that will help to make the producer a well-liked, well-respected neighbor in his community. No matter how religiously one follows the rules of good community relations, however, there is still going to be zoning. The producer can only hope to shape the direction it will take in affecting his operations. As long as we must live with zoning, we should recognize that everything that is said and done about zoning is not necessarily bad.

For example, in a number of communities zoning and land use regulations are being worked out specifically to allow sand and gravel development. Land now is being reserved in the Los Angeles area for sand and gravel mining, and similar protection also is being offered in varying degrees in such widely scattered areas as Spokane, Wash.; San Francisco, Baltimore, Detroit, Long Island, N.Y.; and Salt Lake City.

Many ordinances are tending in the direction of reasonable time limits and other long-time restrictions, giving the operator anywhere from five to ten years to locate new deposits and plan disposition of his old property. Zoning permit requirements and performance standards also are helping to eliminate the fly-by-night operators who often give a black eye to the whole industry by exploiting land, then moving on without any thought of the public interest. With the new highway program coming on, there may be a growing number

Please turn to page 112



The desert beckoned . . .

*and because practically all the raw materials
for the manufacture of cement are available*

. . . a new plant was built

THERE IS A VAST DEPOSIT of high-calcium limestone on the northern slopes of the San Bernardino mountains. It was here in a remote corner of the Mojave desert near Lucerne Valley, Calif., that Permanente Cement Co. located their new \$13 million Cushenbury plant.

The wet-process installation has two gas-fired kilns which will add over 2½ million barrels to

A list of the major equipment used at this plant will be found on page 114

Permanente's capacity, and will permit them to serve the construction industry of southern California, one of the fastest growing residential and industrial areas in the country. The isolated desert location is about 120 miles from Los Angeles.

The desert can provide practically all of the raw materials for cement making, limestone, silica rock, clays, gypsum, water and iron ore. While the plant was set up to use by-product iron oxides from a sulphuric acid plant, there is a deposit of



By WALTER B. LENHART

The desert, with its rich abundance of limestone, gypsum, iron ore, silica rock and clays, provides the backdrop for this overall view of the Cushenbury plant

iron ore at the Kaiser Steel Corp. mine at nearby Lucerne Valley. Deep wells supply the plant with ample water for the wet process.

Modern power and transportation has been brought to the Cushenbury plant, which sits at an elevation of 4,300 ft. above sea level, high above the floor of the desert. Electric power at 115,000 v. and natural gas have been brought across the mountains and desert to the plant, while the Santa Fe built a 29-mile track to the site.

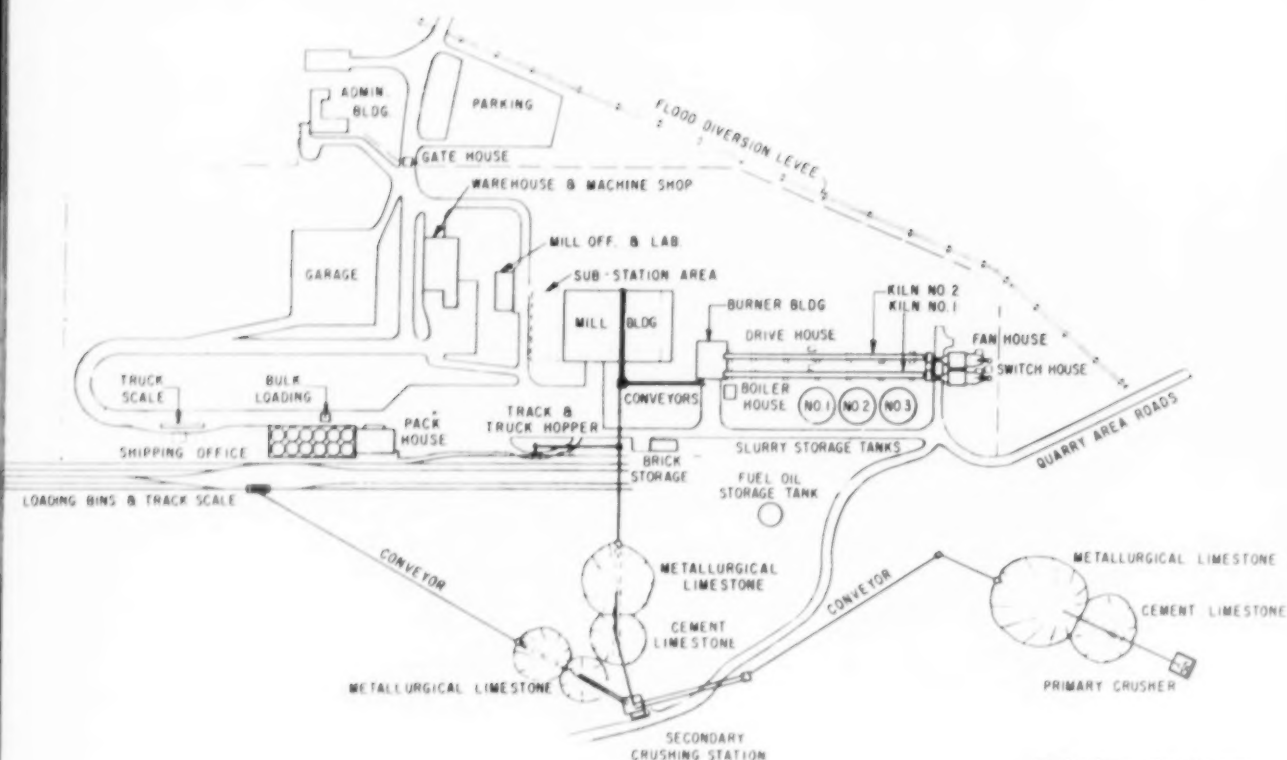
The Cushenbury plant was designed and built by Kaiser Engineers, Inc., a division of Kaiser Industries Corp. They are a world-wide engineering and construction firm who serve practically every field of industrial effort. This new plant is the culmination of their many years of experience in the design and construction of portland cement plants.

A high-quality product is assured by new and exceptional control features throughout the plant. In addition, there is efficient handling of the raw and finished materials, operating conditions are

dustless, and every precaution is taken for safety of the workers. Streamlined functional and artistic design have been developed to a degree seldom seen in industrial plants. Color has been used extensively to key the major pieces of equipment and their accessories.

One of the most outstanding features of the whole Cushenbury operation is the continuous and accurate control of limestone, clay, silica, iron and additives. Using the experience gained in Permanente's gypsum plants at Long Beach and Seattle, the engineers were able to adapt the Waytrol system to the cement-making process here.

The control panel for all the Waytrol units is in the laboratory under the direct observation of the chief chemist. The feed rate for each ingredient is set on the control for each unit producing a particular brand or type of cement. The mill operator can then increase or decrease the total feed to either the raw grind or the finish mills but he cannot change the proportions.



Cushenbury plant layout

The desert beckoned . . .

continued . . .

There are five control units for raw materials—limestone, silica, iron, clay and spalls (a high calcium limestone). A sixth control located in the mill building is used to regulate additives for special cements.

Two controls handle the clinker and gypsum for one of the finish mills and another pair for the auxiliary mill is used for either raw or finish grinding. Altogether there are 11 Waytrol continuous feeders in the mill.

Another exceptional feature of the new plant is the extremely efficient dust collection equipment. Dust collecting specifications were as carefully developed as if the plant were in a densely populated area rather than in a desert. Heavy duty turbovane fans draw the exhaust gases from the kiln through electrostatic precipitators before discharging them into the atmosphere through 100-ft. high stacks.

Dust from the precipitators is collected and conveyed back to repulpers in the kiln feed towers. The dust is wetted down and pugged before it is dropped into the kiln.

The limestone quarry is in the hills above the new plant. The stone is sparkling white and is par-

tially marbleized. It occurs in a dome-shaped structure, folded and brecciated, making it easy to drill, blast and load out.

The stone deposit is being developed along a spiraling roadway with faces opened at intervals of 30 ft. in elevation. Blending of stone for either the cement mill or the steel mill starts here with selective mining in the quarry. Capacity of this operation will be about one million tons a year.

Two grades of stone are processed. One is a high calcium metallurgical grade stone that ranges from 95 to 99-plus percent calcium carbonate, and the other is cement grade stone. While the metallurgical stone will be used in the Kaiser Steel Corp. furnaces it can also be used in the pulp and paper industry, the manufacture of glass and processing sugar.

Quarrying equipment includes a 5-cu. yd. electric shovel to load the blasted rock into the three 16-cu. yd. end-dump trucks. The trucks deliver the stone to a 66 x 84-in. jaw crusher, one of the largest in existence, which reduces the quarry-run rock to minus 8 in. A water spray system in the loading and discharge hopper of the crusher suppresses dust, while a 15-ton gantry crane over the



Conveyors take the limestone downhill from the quarry to the secondary crushing and screening tower and then to either mill or shipping storage

throat of the crusher will be used to fish out any slabs too large for the opening of the jaws.

The bottom of the crusher is about 200 ft. above the level of the raw stone storage area. A 60 in. wide belt conveyor system runs straight out from the crusher to make two piles over a reclaim tunnel. One pile has metallurgical stone; the other, cement stone.

The reclaim conveyor system runs **downhill** from these piles to the secondary crushing station where the fluxstone is screened into 7 x 3½-in. and 3½ x ¾-in. sizes. Shipment of raw limestone from storage can be made by rail, while finished cement can go by either rail or truck.

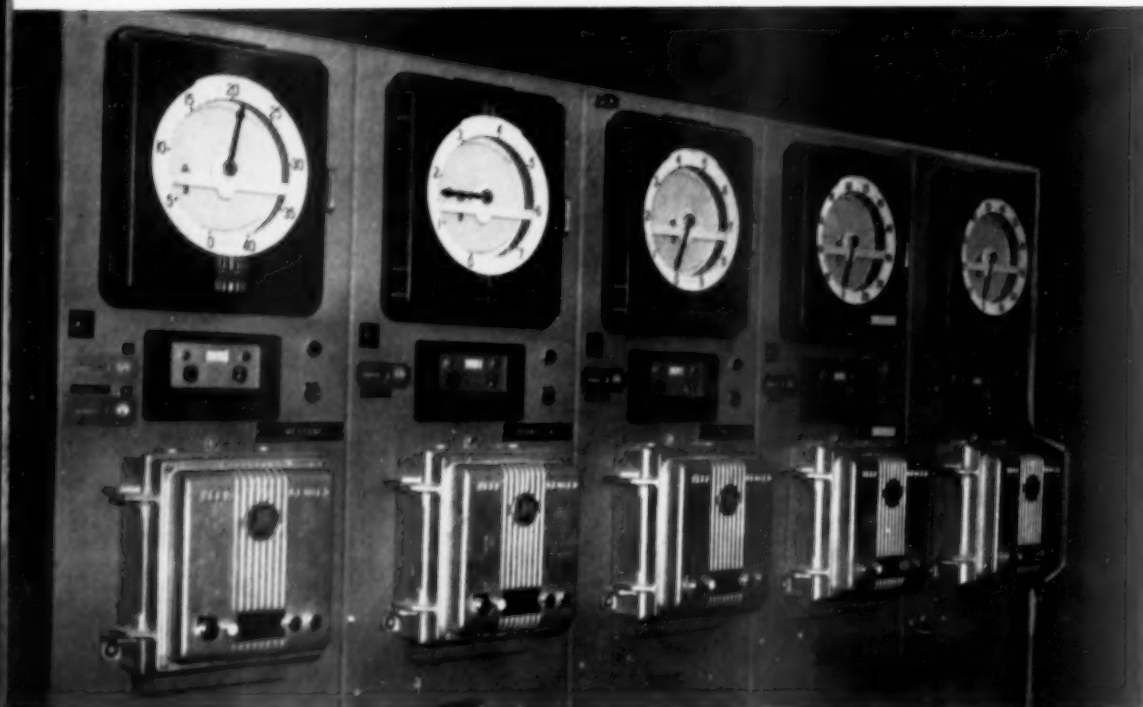
All fines from the preparation of metallurgical rock are blended with the cement rock to improve the cost efficiency of the plant. Plus 3½-in. cement stone is crushed in a 20-in. gyratory crusher, while 3½ x ¾-in. is reduced in an impact mill. Oversize is recycled through crushers and screens until it is properly sized; then it is stockpiled over a reclaim tunnel until needed in the mill building.

Storage in the mill building ahead of the raw grind mill will hold about 350 tons of limestone, 175 tons of clay and about 100 tons of iron oxides.

In the mill building are three 9½ x 36-ft. Uni-

Loading up in the quarry. The shovel is an electrically operated machine with 5-cu. yd. bucket

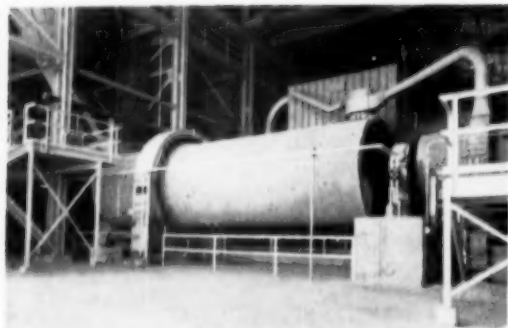




From this control panel the chemist sets the mix ratio for both the raw grind and finish grind mills

The desert beckoned . . .

continued . . .



Fire end of kilns. The kilns are all gas fired

dan two-compartment ball mills. Each is driven by a 1,500-hp. synchronous speed motor through a Symetro drive, largest of this type in California. A single "floating" trunnion supports the overhung load of the mill with its 110 tons of balls and clinker charge and lets the support slide with the expansion and contraction of the mill.

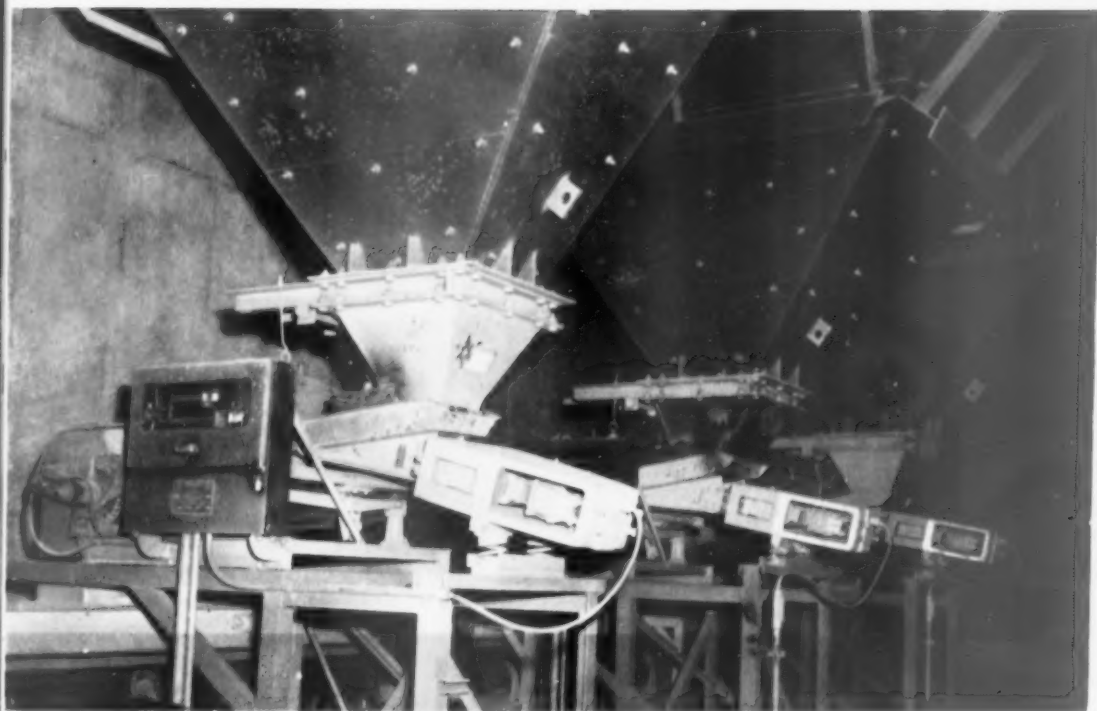
A fixed bearing at the drive end of the mill supports the discharge screen and flexible coupling to

the main drive. The screen is $\frac{1}{4} \times \frac{1}{2}$ -in. slotted wire to remove any tramp. Through-screen material is taken out for further processing.

One of the mills is used exclusively to grind the raw material slurry, another only for clinker grinding. The third is a swing mill, and can be used in either the raw material grinding circuit or the finish grinding circuits.

When grinding raw materials the ingredients from the Waytrol feeders are brought to the mill on a belt conveyor. Water is added to make a slurry about 62 percent solids, and the mill can grind about 90 tph. of dry materials to 95 percent minus 200 mesh. The slurry is screened on a battery of four Vibrex screens with 41/50-mesh cloth. Oversize is sent back to the mill and throughs are pumped to the blending tanks. No water is added on screens and thickeners are not in the plant.

The finish grind mill is rated at 190 bbl. an hour at 1,850 sa. Wagner. Through-screen material at the discharge end is taken to an elevator with an Airslide and elevated to one of three air separators. All three units are put into grinding circuit when two mills are producing finished cement.



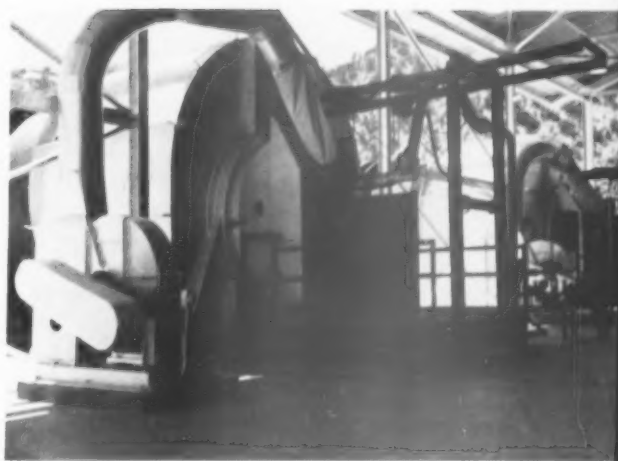
These storage bins are connected electrically with the control panel on the opposite page and proportion the mix into the mills. Once the ratio has been set on the control panel, the man in the mill house can not alter the mix.

Slurry from the raw grind mill is pumped to one of three 30 x 65 ft. storage tanks next to the kilns. Each tank is equipped with air-mechanical agitators. While one tank is receiving a second tank is blending and the third tank is discharging to the kilns. Pipeline and pump equipment is installed so that any tank can serve either kiln or discharge to any other tank.

Each kiln has its own feed tower with floors connecting across at each level. A constant-head box in the top of each tower discharges to a scoop feeder with two inlet lips to guide the slurry into the kiln.

Each feeder is equipped with a "tell-tale" device to let overflow from the constant-head tank flow back to the main storage tank. A slide gate of special design controls the amount of slurry going to the scoop feeder tank, while each feeder has a variable speed drive. A repulper is located in the feed tower to process dust from the electrostatic precipitators to be returned to the kilns.

The two 12 x 450-ft. rotary kilns are gas-fired units with stand-by oil firing equipment. The kilns are about 40 ft. apart, sloped $\frac{1}{2}$ in. per ft. down-



Finish grinding mill

hill, and are driven with 200-hp. 900 rpm. dc. motors. An auxiliary gasoline engine provides standby drives in the event of power failure.

Each kiln is fitted with Kaiser Chemical Div. periclase chrome bricks in the hot zone. The kiln lining brick are arranged as follows, starting at the hot end:

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*Latest equipment provides
almost complete automation*



produces sand and gravel



By A. HACK and W. TOMLIN*

TO MEET THE COMPETITIVE MARKET for specification sand and gravel in the Denver area, the Inland Sand and Gravel Company has built a modern sand and gravel plant. This plant, constructed with the latest equipment available, includes the most recent developments in electrical controls to provide almost complete automation. Close control of operations together with many labor-saving devices permits the plant to produce aggregates to meet ever-increasing rigid specifications in a competitive market.

The net result of careful design engineering and aggressive planning under the direction of A. B. Nuss, vice-president, and John Alger, plant manager, was the efficient production of about 300 tph. of specification materials. The products are sand, pea gravel, sized gravel $1\frac{1}{4}$ x $\frac{3}{4}$ in. and $\frac{3}{4}$ x $1\frac{1}{2}$ in. and crushed gravel for seal coat chips and concrete pipe work.

The deposit is located approximately two miles north and east of Denver on the Platte River below the confluence of Clear Creek. Three to four feet of overburden of rich farm soil overlays the gravel bed which is approximately 25 ft. thick. The gravel is firmly packed, well settled and difficult to dig.

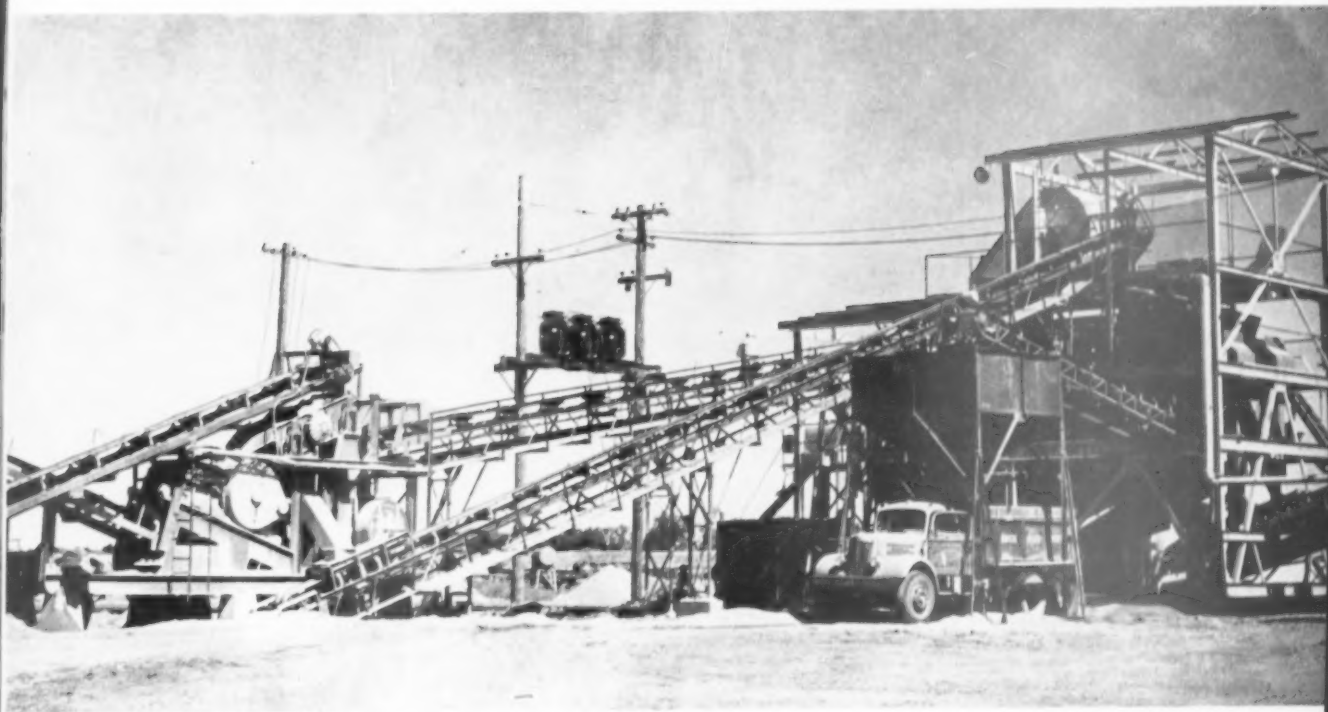
*Hack Engineering Company, Denver, Colo.

The bank does not slide or cave, and this required a particularly effective cutter head for the dredge. The deposit contains approximately 50 percent sand with the balance gravel and occasional rocks up to 7 in. diam.

The management of Inland Sand and Gravel was confident that a properly designed suction dredge was most practical for this deposit although suction dredging of gravel in this area has been tried before with very little success. The engineering staff of Hack Engineering Co., who have made gravel dredges for several years, agreed. They were assigned the design and construction work of the whole plant and the successful performance of the dredge has justified the judgment of management.

The dredge was designed especially for difficult digging conditions in cemented sand and gravel, which will not cave. The dredge hull was constructed of three sections. The center or machinery section has a drop center, to mount the 10-in. type G dredge pump; a 300 hp. wound rotor variable speed motor; a prime pump; a five-drum winch; and a digging ladder. The side pontoons were provided with waterproof compartments.

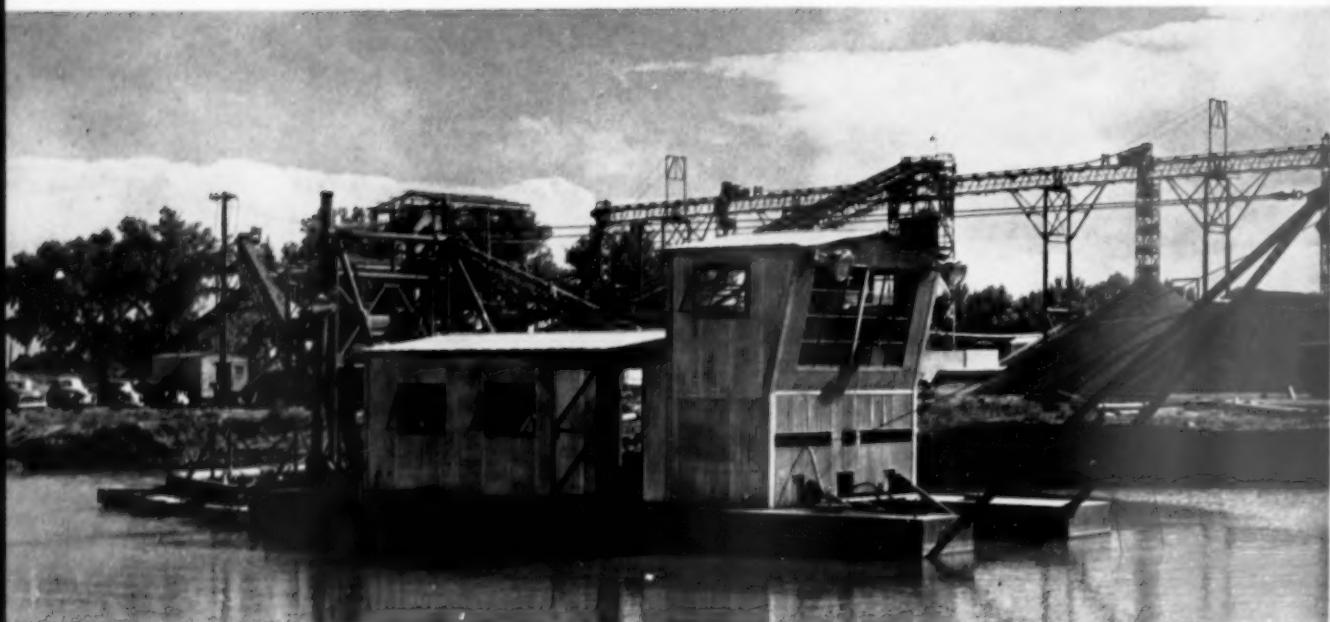
The digging ladder and suction pipe were fitted



Closed circuit crushing plant

View of the gravel stockpiles and the incline delivery conveyor as it comes out from stockpile tunnel. Control center is shown on the platform of the main tower just below the monitoring conveyors





One operator in the sand and gravel barge controls all equipment and mobility of barge from control cabin

Push button control

continued . . .

with a special cutter, and the front A-frame was equipped with steel cable and tackle to raise and lower it. A conventional five-drum winch was provided, one drum for the digging ladder, a drum for each of the two rear spuds and two drums for the front shore lines.

All controls are in an elevated control center, where the operator has winch controls, electric drum controller, electrical control console, vacuum and pressure gauges, all within easy reach.

The barge is powered through a 2,300-v., three-conductor, 1,000 ft. long shockproof cable. Auxiliary equipment is operated at 440 v. from the control center while the pumping motor is driven by 2,300-v. power. All motors were electro-dynamic, while the control centers were especially designed and fabricated.

Due to the extensive size of the deposit, the dredge and plant were built with the expectation of 15 to 20 years' continuous operation. All equipment was selected for long life, minimum maintenance and highest efficiency.

Pumping from the dredge to the gravel screening plant is at the rate of 3,500 gpm. with about 300 tph. of suspended material including the over-

size boulders. The dredge discharge line delivers all material to a 5 x 26-ft. long heavy duty trommel screen, with a 5 ft. long scrubber section and 20-ft. screening section. All minus 1/4-in. material and water from the trommel screen is sluiced over an eight-mesh stationary dewatering screen. Water and minus eight-mesh is sent to a classifier. Here sand is dewatered, discharged into a 36-in. double screw classifier and then conveyed to storage on a stacker belt.

All 5/16 x 1 1/4-in. material through the trommel screen is directed to a 36-in. coarse material classifier with eight paddle sections. Sticks and trash are flushed off and material is sized on one of two three-deck 5 x 10-ft. vibrating screens, where 5/16 x 3/4 in., 3/4 x 1 1/2 in. and minus 1/4 in. is separated. The first two sizes are discharged onto stockpile conveyors, while the minus 1/4-in. material is discharged into a 35-ft. water scalper. Together with the minus 1/4-in. material from the trommel screen it passes over the second three-deck 5 x 10-ft. vibrating screen with undersize going to the water scalper. Separation of sand sizes are made at the water scalper, with provisions made to discard the tailings.

The plus 1 1/2-in. oversize material is directed to the closed-circuit crushing plant. Oversize gravel, from the trommel screen is discharged onto an 18 in. wide x 90 ft. long conveyor. This carries the



Control cabin inside the barge. The console controls the equipment; handle of console controls pump motor and the levers control suction line and maneuverability of the dredge

An automatic traveling tripper places the sand on the stockpile from the horizontal monitoring conveyor. Movement of the tripper for placement of sand is done by the operator from the control house



material to a self-contained crushing section which consists of a 10 x 36-in. jaw crusher, 18 x 24-in. roller crusher, and a single deck 4 x 8-ft. scalper screen. Material from the feeder passes through the jaw crusher and is conveyed to the scalper screen with 1½-in. screen deck. Undersize returns to the trommel screen in the washing plant. The oversize passes through the roll crusher and then goes back to the scalper screen in a closed circuit.

Two 18 in. wide, 154 ft. long conveyors take the ¼ x ¾-in. and ¾ x 1½-in. gravel to the stockpiles. Each conveyor rises at a 17-deg. incline to a height of 46 ft. where delivery is made to two horizontal monitoring conveyors above the two stockpiles. Storage piles are placed over a 10 ft. diam. fabricated steel tunnel, and each stockpile has a capacity of 18,000 tons. Delivery from the horizontal conveyors and distribution over the

stockpile is done by stationary trippers. These make elliptical instead of cone-shaped stockpiles to hold more material.

Sand is delivered to the sand stockpile from the double screw classifier by a 24 in. wide, 116 ft. long inclined belt conveyor, which has 15 ft. of level section ahead of the incline. Sand is transferred from this conveyor to a 24 in. wide, 112 ft. long horizontal stockpile belt conveyor which is equipped with a travelling tripper. Movement of this tripper is controlled by the operator from the control house. The operator can store sand at any point along the length of the stockpile, which holds 18,250 tons.

Gravel is reclaimed from the stockpiles, by one of five feeders discharging to one of two 24 in. wide, 106 ft. long conveyors in the tunnel under

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Sand and gravel producers find that . . .

an expanding market poses some

Here's how they went about overcoming traffic snarls, time-wasting delays

IN THE SPRAWLING LOS ANGELES MARKET, the biggest metropolitan county area in the country, the most difficult problem sand and gravel producers encounter is moving their products to market. Some 32,000,000 tons of sand and gravel come into the section each year, and a high percentage of this total is trucked to market.

As the city spreads and its demand for construction materials grows larger, it pushes the quarries further and further north and east, and imposes residential areas, filled with time-wasting stop-lights, between producers and their delivery sites. A one-minute delay for each truck coming into Los Angeles in a year would cost almost a quarter of a million dollars in lost time. Even the famed Freeways have become traffic problems, with their thousands of cars and few exits.

Such conditions could almost strangle the industry if the producers didn't do something about it. But these enterprising men value their lucrative market area, and they have taken steps to insure fast and economical delivery.

While traffic is a problem from gravel source to job site, one of the worst tangles was along the San Gabriel River, where several quarries are located. The trucks from these plants funneled into one road south to Los Angeles proper at a peak rate of 240 vehicles per hour. Residents were unhappy and so were the producers who had to hold to residential speed limits and make frequent stops at lights and corners. The Southern California Sand and Gravel Association met regularly with the civic groups in the neighborhoods these trucks traversed and did yeoman's work in getting the state to allocate funds for a truck express highway that would bypass almost five miles of this con-

gestion and connect to several major arteries. Completed in 1954, the Rivergrade road is open to all traffic. Producers estimate that the road saves them at least \$500,000 a year.

In a continual effort to get there firstest with the mostest, producers are constantly experimenting with every type of equipment. Seen more in the Los Angeles area than in any other part of the country are "telescopic" trucks for hauling. Most users agree that these rear-dump trucks, hauling a payload of 20 to 22 tons, offer the best advantages. Several firms have made a study of diesel-powered vehicles, with favorable results. (See ROCK PRODUCTS, June 1957, page 149.)

An increasing number are using two-way radio specifically to report on tie-ups on the Freeways in time to route their trucks around them, since these snarls have been known to back up traffic for 20 miles in seven minutes and halt it for hours.

Innovations are not limited to delivery problems. During the peak morning hours, trucks boom out of the plants and delays in loading, dispatching and weighing can be as costly as traffic delays. To



rough transportation problems



Here, the Rivergrade road passes under one of southern California's important freeways

take care of about 4,400 trucks per working day all plant operators have had to find the quickest methods of getting vehicles in, loaded and out. In many plants one-way traffic is the rule. One forward-looking operator is planning to install five or six television cameras and loudspeakers, all strategically located about the loading areas so that the dispatcher can keep everything moving smoothly in the yard.

One firm with several yards, Consolidated Rock Products Co., has purchased Insley clam-shell rigs mounted on Maxi chassis so that the units can be moved on the road from plant to plant as the need arises. Several companies have two or three sets of scales for weighing and operate fleets of loaders and cranes.

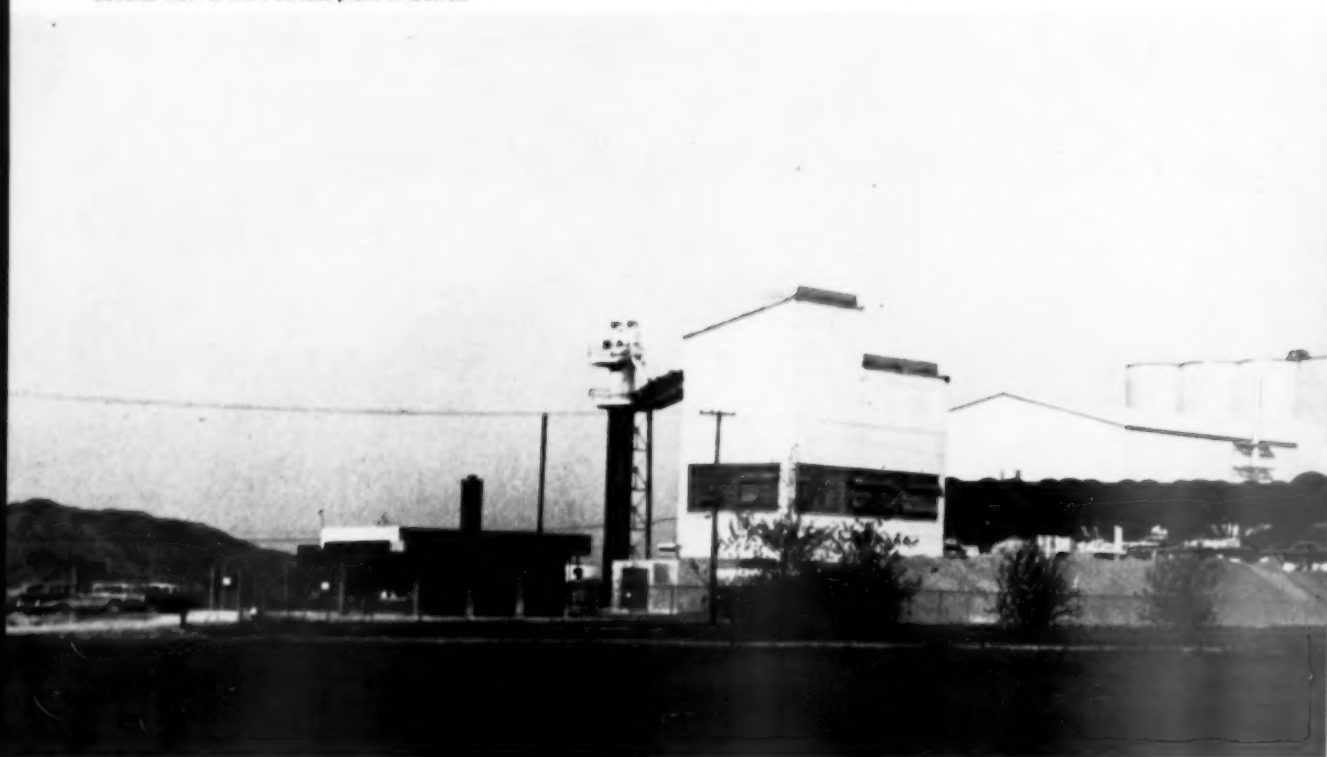
Operating conditions in the Los Angeles area are still a long way from ideal, but the resourceful producers who serve it are improving them constantly by seeking the best answers to their transport problem so that they can continue to satisfy customers in this rapidly expanding market.

END

Mobile crane is able to quickly move from plant to plant as the need arises



General view of the Peerless plant in Detroit



Where's a better place to build
a cement plant than . . . right



The river provides access to the Great Lakes for economical water transportation



By ELWOOD MESCHTER

The new installation is a wet process, single kiln, fully integrated mill. Kiln capacity is $1\frac{1}{4}$ -million barrels of clinker a year with grinding capacity of nearly two million bbl. a year of finished portland, air-entraining, blast furnace slag and high early strength cement. Two more kilns can be added whenever the production is needed.

The plant is one of the most efficient producers in the country and operates with 65 men on three shifts. It is the result of economic studies, careful engineering design and exacting specifications for equipment under the supervision of H. L. Henson, vice president-engineering for Peerless Cement Corp. Dust, smoke and fume controls were developed to meet the high requirements of the Detroit Planning Commission, and the operation is a model of good housekeeping and cleanliness.

The Brennan Avenue plant has several innovations in cement making. Minus 1-in. limestone has proved to be ideal for reduction in a rod mill. The stone is fed into a 7 x 14-ft. mill with washed clay and the minus $\frac{1}{4}$ -in. product is introduced to a 7 x 22-ft. tube mill. This mill produces a minus 200-mesh slurry ready for the blending tanks.

Another variation developed by the Peerless organization is the use of attrition mills to reduce either clay-limestone slip or clay-limestone slurry.

The stockpiles of raw materials are managed with a bulldozer. This is a new approach at a time when there is a trend toward using belt conveyors to stock out and reclaim large volumes of bulk materials. Studies by the consulting engineers

in the middle of its major market?

ECONOMICAL TRANSPORTATION of raw materials made it advantageous for Peerless Cement Corp. to build a new cement plant right in the middle of their major market—metropolitan Detroit. The new $7\frac{1}{2}$ -million dollar Brennan Avenue plant is on the River Rouge, giving easy access from the Great Lakes for incoming shipments of limestone, coal and clinker.

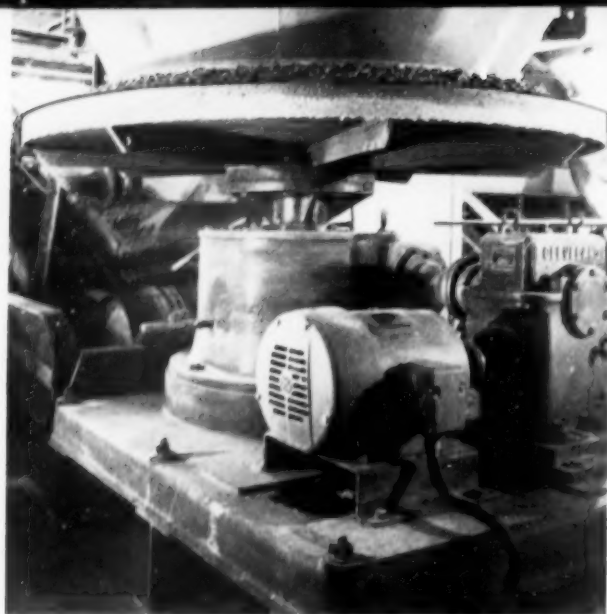
Land in the city is at a premium and the Peerless management planned the effective use of every foot of the 14-acre tract. It is probably the first cement mill in the country to use a rod mill for the primary reduction of limestone to a slurry. This feature alone made it possible to use the Brennan Avenue site and to allocate space for expansion, according to A. C. Eichenlaub, executive vice president-operation. Rod mill grinding eliminated the large thickeners, classifiers and filters common to wet process cement plants.

proved that a bulldozer could handle the long, wide and deep piles dictated by the compact area allocated for outside storage. One shift operation of the 'dozer has proven adequate to spread and compact incoming coal from the self-unloading boats and to reclaim into a hopper.

The bulldozer works very well with the limestone boats, distributing the stone into piles 90 ft. deep. Limestone is reclaimed from outside storage to inside storage where it is handled with overhead crane and clamshell bucket.

An unusual feature of limestone storage is the heavy pavement of the area. A concrete slab 30 in. thick rests on nearly a thousand piles driven 85 ft. to bedrock. This slab supports the 90,000 tons of limestone in a 90 ft. deep pile, the capacity of about eight boats.

Raw materials must be stockpiled during the eight months of the Great Lakes shipping season to assure 52 weeks of kiln operation. Outdoor storage handles coal and limestone, while the mill



Raw limestone is fed into the rod mill by means of this rotary table feeder. This is the first rod mill of its kind in the country to be used for breaking down the raw limestone in this manner



Cement plant comes to its market

continued . . .

building provides covered storage for clay, gypsum, granulated slag and clinker which are brought in by rail or by truck.

The main unit in the dust control system is a 50,000 v. electrostatic precipitator in series with a high-efficiency, mechanical dust collector. These collectors handle the exhaust gases from the kiln. Dust from the mechanical collectors is put into a pugmill and the balled product is reintroduced into the kiln. Dust from the precipitators is difficult to wet and has undesirable impurities. This dust is sent to a small balling wheel and the pellets are discharged as refuse.

Two overhead cranes in the mill building handle the raw materials. One crane with clamshell can take clay from truck dump and either lift it to the hopper over the wetpan or pile it for storage. Since the iron-bearing, sandy clay comes from local pits, only a few days supply is stored.

The second crane performs a number of operations. It handles limestone from inside storage to hoppers above the rod mill. It stacks clinker, gypsum and slag, and whenever slag cement is made, distributes and mixes slag with clinker before grinding. Clinker and gypsum are loaded into live-storage hoppers ahead of the finish grind mills.

Operation of the production process starts with the reduction of the raw blue clay in one of a pair of wash mills. Monolithic concrete tanks house the

mills which are similar to wetpans in the ceramic industry. Impurities are floated off while minus $\frac{1}{4}$ -in. clay is pressed through grids in the bottom of the mills and sluiced to one of the two wash mills. Here air and mechanical agitation makes a homogenous clay slip of uniform density which is pumped to the rod mill.

Blended and finished slurry from the rod and tube mills is pumped to one of a pair of holding tanks ahead of the $11\frac{1}{2}$ x 425-ft. rotary kiln. The slurry is fed to the kiln with a ferris wheel feeder. Excess slurry is recycled back to holding tank.

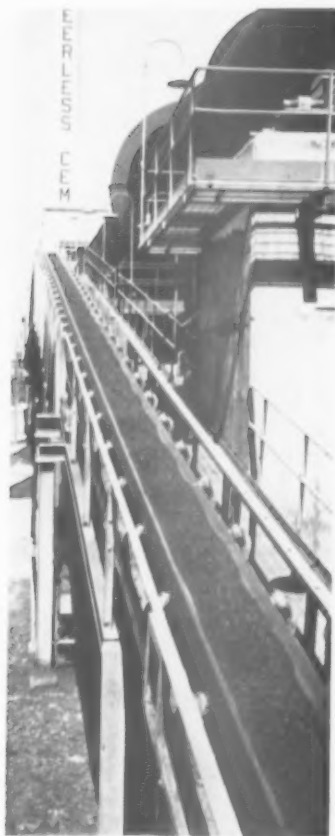
Kiln production can vary from 24 to 29 tph. of raw clinker, burning between six to nine tph. of coal. Clinker is discharged from the kiln at about 2,600 deg. F. and dropped into a reciprocating grate cooler where the temperature is reduced to 150 deg. F.

The cooled clinker is crushed and elevated to a belt conveyor with a drag chain conveyor. A 24-in. wide belt conveyor system carries the clinker nearly 500 ft. back to the mill building for storage. During the winter months the overhead crane places the raw clinker where it can be reached with the bulldozer and stacked outside.

The finish grinding department consists of two closed circuit grinding systems. Automatic weighing feeders meter about 25 tph. of clinker and about 1 tph. of gypsum into each of the $10\frac{1}{2}$ x 17-ft. ball mills. Finished cement is collected and



Overall view of the raw limestone (foreground) and the raw clinker (background) storage. Limestone is handled by 'dazer'



Belt conveyor takes clinker from clinker cooler to storage

sent to storage in pneumatic conveyors. Oversize is returned to ball mill circuit in Airlslides. Production of finished cements is about 260 bbl. an hour.

The fuel system uses a bowl mill to pulverize the coal and blower which blows the controlled volume of preheated air and measured weight of coal into kiln. Above the mill is a bunker which holds about 200 tons of coal, enough for about 24 hours of operation at top capacity. Coal is elevated to the storage hopper with a bucket elevator fed from the reclaim hopper at ground level. The heavy duty bulldozer pushes coal from the storage pile to the reclaim hopper.

A complete set of kiln controls is located in the firing building. The single man here can control the many variables in the operation of the kiln and permit it to operate at maximum efficiency almost continuously. Recording controls include an oxygen analyzer and combustibles indicator, feed end temperature and kiln speed instruments. Ammeters indicate all motor loads, and monitoring controls immediately warn of any rapid changes in the operating conditions.

Bulk storage on the property is relatively limited. Eight monolithic concrete silos have a capacity of about 160,000 bbl. of finished cements. Bulk shipments can be made by truck and by rail at the same time, and four platform scales can weigh automatically and dispatch two trucks and two gondolas at the same time.

The new Brennan Avenue plant is supervised by C. J. Line, superintendent of the nearby Jefferson Avenue plant. He is assisted by Robert Breszny at the new plant. The operation of the two plants is closely coordinated; the new plant handling raw clinker from Port Huron or Jefferson Avenue for grinding, and the Jefferson Avenue plant handling the packaging and warehousing, with standby capacity for bulk storage of finished cement.

This arrangement is part of the Peerless management's plan to operate their three self-sufficient cement plants as an integrated, coordinated production unit. In this way they will be flexible enough to compete most effectively in the rich but highly competitive market in Michigan, eastern Indiana and western Ohio.

The Brennan Avenue plant was built with the prospect that its capacity can be tripled with a relatively small additional capital investment. There is room for two additional kilns, and the mill building can be expanded to house the necessary additional raw grind and finish grind mills.

With increased production the site can be most economically operated. There is storage room for the higher production, and many auxiliary serv-

Please turn to page 122

By HUBERT C. PERSONS



Here are three complex operations where efficient engineering paid off

THE THREE LARGE PLANTS of the Campbell Limestone Co. are each so efficiently engineered that a complex assembly of heavy equipment functions as smoothly as one superb machine. The Campbell operations, all in the northwestern part of South Carolina, are near Blacksburg in Cherokee County, at Pacolet in Spartanburg County and at Beverly in Pickens County.

In the Blacksburg and Beverly plants, advanced principles of automation have been applied to the crushing, grinding, screening, washing and all material handling operations. Conveyors and processing machinery are electrically interlocked so that when one operation is interrupted all movement behind it stops. In addition, at either plant a mill operator in a glass-sided tower is in push-button control of all moving machinery and water supply as well. The mill operator keeps in communication with all parts of the plant by telephone. His panel board is studded with 15 push buttons by which he may start or stop as many different pieces of equipment. There is also a signal system which warns the control tower when oil pressure is low in crushers in the circuit.

And hand-in-hand with highly efficient operations, the Campbell plants are examples of unusual neatness and attractive appearance of plant entrances and office areas. Well-tended lawns and flower beds are the rule. It is also the practice to

seed the spoil banks at intervals for the dual purpose of preventing unsightly erosion and to improve appearance of the area around the quarry.

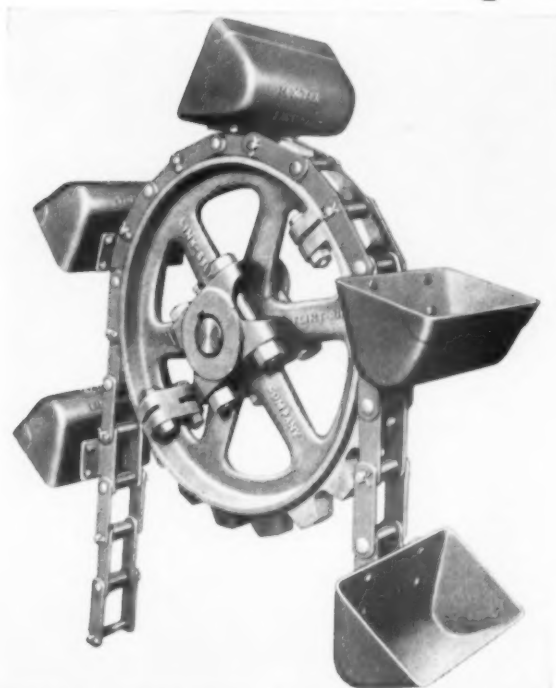
Until 1953 a cotton field occupied the 191-acre site of the Blacksburg plant on which the Campbell Limestone Co. has leased mineral rights. In 1948 the company began exploratory borings on the property. From these borings an area of 71 acres was found to have deep deposits of dolomitic limestone suitable for agricultural use. Chemically this limestone contains from 52 to 58 percent calcium carbonate, 35 to 42 percent magnesium carbonate with five to eight percent insoluble elements.

Operations at the Blacksburg plant began in September, 1954. The quarry pit is approximately 12 acres in extent. The overburden is red clay ranging from 10 to 25 ft. in depth. At the beginning of 1957 two 20-ft. benches were being worked. Down to the last 5 ft., the overburden is removed with scrapers. A dragline with 1½-cu. yd. bucket removes the last 5 ft. of the overburden. Side dump trucks haul overburden to spoil bank.

Blasting is done about once a week. Since the rock shatters well, very little secondary blasting is required. From 5,000 to 12,000 tons of stone are thrown down by each blast.

Please turn to page 88

Link-Belt SS Class bushed chain outlives previous chain 4 times



LONG, TROUBLE-FREE SERVICE of SS-111 chain (above) proves that it pays to select the right chain for a specific job from Link-Belt's complete line. It also proves that there's no need to pay a premium for costly special alloy steel chains.

18 million tons, 26 years later... SS-856 chain still serviceable

Sets record in cement mill elevator service

The more than quarter-century of continuous handling of raw materials at a Pennsylvania cement mill illustrates the long-wearing durability of Link-Belt SS-856 elevator chain. This amazing service record under extremely tough conditions proves that it pays to pick the right chain from Link-Belt's complete line.

Link-Belt SS-856 chain is made of high carbon steel sidebars with nickel alloy pins and bushings. Hardened sidebars give additional strength plus greater resistance to wear and pitch hole distortion. In addition, accurately machined pitch holes assure proper pitch and tight press fit of mating parts—extend chain life. The hard, smooth surfaces of steel joints repel gritty materials... resist abrasion.

Link-Belt elevator chains are available with ultimate strengths up to 200,000 lbs.



Outstanding record established in severe, abrasive elevator service

This remarkable service record set by a Link-Belt SS-111 bushed chain (left) proves that often there's no need to go to excessively costly special alloy cast chains to get long life. Used at an Indianapolis (Ind.) fertilizer plant, this chain handled an average of 75,000 to 80,000 tons of fertilizer before requiring replacement. The previous type of chain handled only 18,000 tons and required four times as much maintenance.

Designed for abrasive jobs

Link-Belt SS-111 bushed chain offers large joint bearing surfaces for greater wear resistance and trouble-free service in heavy-duty conveying and

elevating. Sidebars of selected bar steel are accurately formed and machined for tight press fit of pins and bushings. The latter are made from tough, hardened steel and locked against rotation in sidebars.

These straight steel sidebars with hardened steel pins and bushings provide needed strength to prevent distortion under continuous heavy loads. Smooth, tough surfaces repel gritty materials, prevent packing in critical joints, resist abrasion and corrosion.

Many sizes of these heavy-duty chains are interchangeable with Link-Belt combination chains. And a wide range of attachments makes them adaptable to specific conveying and elevating requirements.

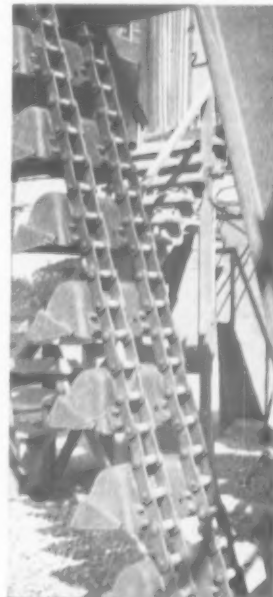
Link-Belt SS-102½ bushed chain extends life of stone elevator

Several years ago an eastern stone quarry installed a main bucket elevator to handle 200 tons per hour of minus 2½-in. mixed stone. Service life of the original two-strand elevator chain was found inadequate. After several shutdowns, it was replaced with Link-Belt SS-102½ chain with K-5 attachments at every third link.

This long-life, wear-resistant chain is now in its fourth year of uninterrupted operation. It has carried over 475,000 tons as compared to 60,000 tons which was considered normal life for the previous chain.

Recent inspection of the SS-102½ chain reveals that it is good for another long stretch of service. Elimination of shutdowns and replacements more than justified the slight difference in cost between this and the original chain.

STONE ELEVATOR has buckets at every third link. Centers are 65 feet, with elevator inclined 75 degrees from the grade. Chain speed is 280 feet per minute.



HEADQUARTERS for chains, sprockets and other Link-Belt conveying and mechanical power transmission products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor.

LINK-BELT

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LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock-Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarborough (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

11-294



Conveyor takes advantage of natural slope of terrain to increase storage area capacity, left, at Pacolet plant

Efficient engineering

continued from page 86



Fully loaded and steeply inclined belt conveyor at Pacolet plant

Three 16-ton rear-dump trucks, used to haul quarry rock, are loaded with a 2-cu. yd. shovel. The trucks haul the stone to the primary crusher, a 30-in. gyratory, where it is reduced to pieces ranging from 4 to 8 in. in diam. The crusher discharges the rock to a 36-in. belt conveyor which takes it to the No. 1 screening station equipped with a 5 x 10 ft. scalping screen. Here any dirt and the minus 1½-in. stone is taken out, and discharged



Conveyor from primary crusher to No. 1 screen tower at Blacksburg plant

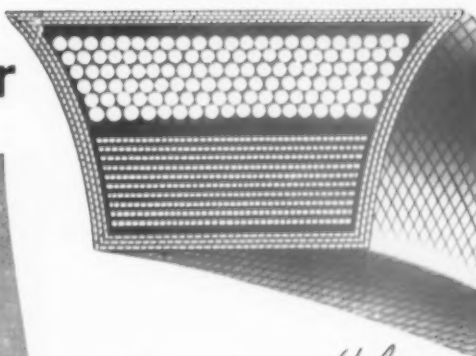
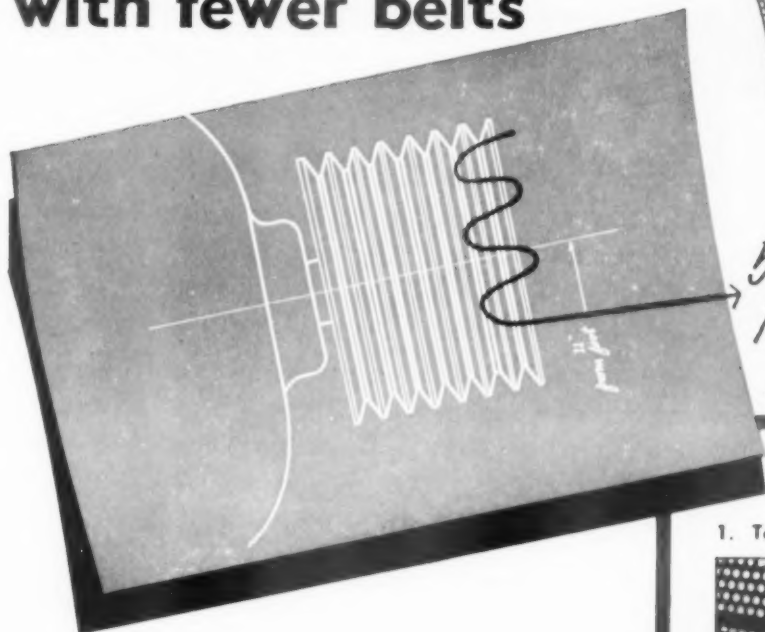
to a 20-in. conveyor which takes it to the crusher run stockpile. However, if the stone is clean the scalping screen is by-passed and the material goes by conveyor to a raw material surge pile as plant feed in 8-in. size and down.

The raw material surge pile is above a 9 x 10-ft. diam. reclaiming tunnel 50 ft. long. From the tunnel a 30-in. belt takes the stone 150 ft. to screen tower No. 2 where it passes over a 4 x 12-ft. double-deck Lowhead screen. This takes out 2¼ to 1¼-in. feed for the agricultural lime pulverizer. This material is surge-piled over another concrete tunnel by a 100 ft. long, 20-in. stacker conveyor.

Oversize material from screen tower No. 2 goes

Please turn to page 92

Cut sheave width and weight ...
get same horsepower
with fewer belts



*5 Gates Super Vulco
Ropes do the work of 7
standard V-belts*

Where space is limited and weight a factor, design your drive with this important fact in mind:

**5 Gates Super Vulco Ropes
do the work of 7 standard V-belts**

That's because a Gates Super Vulco Rope has 40% more horsepower capacity — delivers more horsepower per dollar invested than any standard V-belt drive. Sheaves with fewer grooves cost less ... weigh less ... take less room. Drive design is invariably improved.

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ALL these advantages**

1. Tough, resilient Tensile Cords



Super strong resilient tensile cords provide 40% greater horsepower capacity ... easily absorb heavy shock loads ... reduce number of belts required ... save weight and space.

2. Concave Sidewalls (U.S. Pat. 1813698)



Concave sides (Fig. 1) increase belt life. As belt bends, concave sidewalls become straight, making uniform contact with sheave groove (Fig. 1-A). Uniform contact means less wear on sides of belt ... far longer belt life.



3. Flex-Weave Cover (U.S. Pat. 2519590)



A Gates exclusive: provides greater flexibility with far less stress on fabric. Cover wears longer ... increases belt life ... more power available to driven machine.

4. High Electrical Conductivity

Built into Gates Super Vulco Ropes for safer drives (in explosive atmospheres).

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TPA 248

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All Kennedy Machinery and Equipment is engineered and built to meet specific requirements. The experience and advice of our engineers is at your disposal in choosing the equipment best suited to meet any given assignment.



General view of M & M STONE CO. at Harleysville, Pa. showing K V S Swing Jaw and Gyratory Crusher, Double Deck Vibrating Screens and Heavy Duty Rock Feeders in operation.

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LAKE ONTARIO PORTLAND CEMENT CO., PICTON, ONT. 6,000 ton per day aggregate plant designed for marine and land shipments. Plant also supplies cement rock for 5,000 bbl. cement plant nearby.

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- Classifiers
- Pneumatic Transport Systems
- Dust Collectors
- Complete Cement Plants
- Complete Lime Plants
- Waste Heat Boilers
- Pulverized Coal Firing Systems



AGGREGATE PLANT FOR SARIYAN DAM, TURKEY, showing secondary crusher house and conveyor system. Complete aggregate plant supplied by Kennedy-Van Saun.



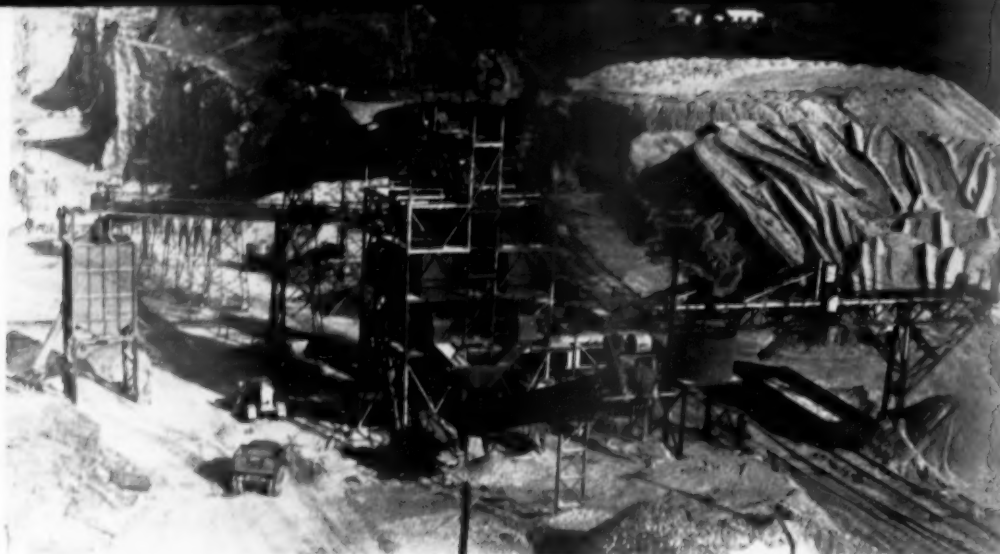
VENDA NOVA DAM, PORTUGAL. Crushing, screening and sand making plant . . . capacity, 400 tons per hour. Designed and furnished by Kennedy-Van Saun.



OTISVILLE SAND AND GRAVEL CO., CUDDEBACKVILLE, N. Y. 200 tons per hour sand and gravel plant equipped with Kennedy overhead eccentric Jaw Crusher; gearless gyratory secondary and tertiary crusher, vibrating screens and conveyors.



REFRACTORY SAND COMPANY, ANDREAS, PA. 5' x 12' Kennedy center peripheral discharge Rod Mill. Used for accurate sizing of commercial and refractory sand.



Crusher run station and bins at the Beverly plant

Efficient engineering

continued from page 88



Shovel loading truck at Beverly quarry face

into a 4-ft. standard cone crusher and a 3-ft. short-head crusher. These reduce the material to minus $1\frac{1}{2}$ -in. and discharge it to a 24-in. belt which returns it to main 30-in. conveyor, closing circuit.

The minus $1\frac{1}{4}$ -in. material goes by 24-in. belt to the No. 3 screen tower located above a battery of seven loading bins. A 5 x 15-ft. Ripl-Flo triple-deck sizing screen is installed in this tower. Half of this top deck is $\frac{3}{4}$ -in. screen, and the other half is $\frac{1}{2}$ in. The entire middle deck screen is $\frac{1}{2}$ in. diam. and the third deck, where the material is washed, is an eight-mesh sand screen. Three sizes of stone are produced on these three screens: $1\frac{1}{4}$ to $\frac{3}{4}$ in.; $\frac{3}{4}$ to $\frac{1}{2}$ in. and $\frac{1}{2}$ to eight-mesh and minus. The minus eight-mesh material in agricul-

tural limestone size range is washed through a flume about 200 ft. to a settling pool from which it is recovered by a $\frac{1}{2}$ -yd. dragline.

The 350 gpm. of water required for washing and other plant needs is supplied by two reservoirs on the plant property. A pumping unit draws the required water through a six-inch pipe.

Four 200-ton bins and three 50-ton bins comprise the battery of seven bins beneath screen tower No. 3. Material of various sizes drops into the proper bins directly from the screen tower. From the bins the stone may be loaded into trucks or hauled to stockpiles. This material may also be hauled by trucks and dumped into hoppers, then conveyed to a Lowhead 4 x 12-ft. screen where stone is rewashed and again placed into bins.

The $2\frac{1}{2}$ to $1\frac{1}{4}$ -in. sizes which are separated out in screen tower No. 2 are conveyed to an agricultural lime pulverizer. This pulverizer reduces the material to minus $\frac{1}{2}$ -in. at the rate of 40 tph. The stone is then passed over a 5 x 14-ft. double-deck Ripl-Flo screen with a top deck of $\frac{3}{4}$ -in. cloth and a 10-mesh bottom deck. Plus 10-mesh material is circulated back into the pulverizer.

The Blacksburg plant produces agricultural limestone sold under the trade name, "Soil Sweet." It also produces concrete and asphalt aggregate and crusher run material. Some stone in $2\frac{1}{2}$ to 1-in. sizes is sold to foundries as flux stone.

Stone for rail shipments is trucked one-half mile to a rail siding and dumped into an elevated hopper. Agricultural limestone is shipped in box cars and is loaded with a box car loader and piler.

Daily capacity of the Blacksburg plant is 2,000 tons of all types of material. H. T. Dill is plant superintendent. T. C. Collison is plant manager.

Please turn to page 118

ALLIS-CHALMERS

HD-6

Tractor-Dozer

65 belt hp!

up to 15,500 lb drawbar pull!

forward speeds from 1.5 to 5.5 mph!

reverse to 4.1 mph!



**MORE POWER—BETTER DOZING SPEEDS—
BIG-DOZER DESIGN—NEW HANDLING EASE!**



Only dozer of its size with these basic advantages . . . engine-mounted rams, long push beams, fewer linkage points (only 2 instead of 5 or 6). These big-dozer features all combine to provide more accurate, gouge-free dozing . . . longer equipment life.

Convenient rotary-valve blade control makes the HD-6 the easiest handling dozer of its size. With more than 5½ feet of track on the ground, it has outstanding flotation . . . yet turns easily in any terrain. The HD-6 also combines large, low-set front idlers with a blade snugged close to the radiator guard . . . to provide balance that means better dozing, more work done under any conditions!

You can see it . . . but
there's only one way to
prove it—on **your** job!



cement kiln maintenance

UNUSUAL TECHNIQUE REDUCES ABRASIVE WEAR



Arc welding on iron base alloy rod containing chromium boride crystals to the inside of the die ring

THE EXTREMELY ABRASIVE NATURE of cement clinker makes die ring wear an important criterion when selecting a finish grinding mill. For this reason, Bradley Pulverizer Co. has invested considerable time and money in research and development programs designed to improve die ring wear resistance. They have studied various base materials, heat treatments and surface coatings, including almost every commercially known hardfacing alloy. Of all materials tested, best results were achieved with a standard die ring base of carbon steel with an application of a combination of alloy rod and paste-type hardfacing materials.

This technique was applied and analyzed by Universal Atlas Cement Co. in the mills at their Northampton, Pa. plant. Here they tabulated die ring costs on white cement production as part of their continuing program of equipment evaluation. They found that low initial cost is certainly no measure of long-range economy. The die ring made of a standard base material alone costs less than half as much as a hardfaced unit, yet the cost per unit of production is nine times greater.

Another important saving not tabulated has to do with equipment maintenance. Removal of a worn ring and installation of a new one is a costly procedure. Not only does it involve die replacement labor costs, but downtime as well. Loss of production may often prove to be the more costly item.

Considering maintenance on the basis of the number of replacements required, Table 1 shows that the hardfaced ring will outlast 21 unpro-

tected carbon steel rings or more than three chilled iron alloy rings. Total cost savings, including maintenance and machine down time, may actually be substantially more than the 67 or 90 percent saving in relative cost per unit of production.

Hardfacing at the Bradley Pulverizer Co. plant is performed with the standard base metal die ring mounted in a special holding fixture. The fixture is equipped with a hand wheel, gears and rollers to permit rotation of the ring through 360 degrees. The first step is an arc welding application of an alloy rod of an iron base alloy containing chromium boride crystals to the inside diameter of the die ring. This rod is easy to weld and possesses good abrasion resistance and excellent impact resistance.

After the inside diameter of the die ring has been arc welded, a uniform thickness of a chromium boride alloy paste is applied. The paste is spread on the entire inside diameter of the die ring with a spatula or putty knife and allowed to air dry. It is then fusion bonded to the welded area and base metal with a carbon arc torch producing a hard (68 to 72 Rockwell "C") surface with excellent abrasion resistance.

The finish obtained with this treatment is highly satisfactory for clinker grinding operations. The hardfaced die ring can be put into service immediately. When it finally wears down, the ring can be reclaimed by repeating hardfacing process.

Please turn to page 96

You can see it, but there's
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what the **HD-6** can do for you!



**Call your nearby
Allis-Chalmers construction machinery dealer
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Please have the Allis-Chalmers construction machinery dealer
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Name

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City State

Type of Work



Finished die ring being inspected

Cement kiln maintenance

continued from page 94



Hardfaced die ring of a mill installed at Universal Atlas Cement Co. where the hardfaced rings had been in service for several months.



Flights on this cement pump screw assembly are protected by the hardfacing technique

Universal Atlas has turned to hardfacing in a number of places other than cement mills in an attempt to improve service life and cut costs. Among these are a screw conveyor for cement pump, a slurry pump suction plate and crusher rolls.

The flights of the conveyor screw assembly are protected with a welded overlay of a nickel base chromium-boride alloy which produces excellent abrasion and corrosion resistant properties. Hard-face protection of this type resulted in increased service life protection.

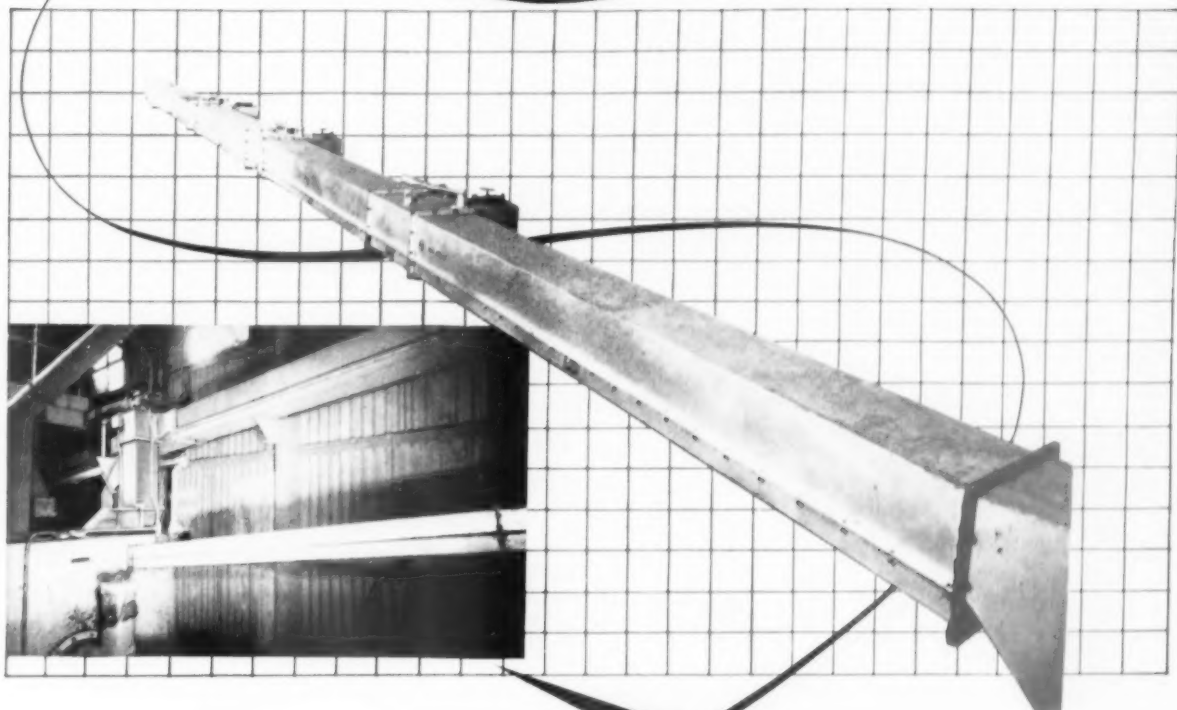
Table I

	Relative cost	Relative production	Rel. cost per unit of prod.
Standard base material (carbon steel)	1.00	1.0	1.00
Chilled iron alloy	1.93	5.9	.34
Hardfacing rod (No. 1. and sweat-on paste)	2.32	222.0	.104

Many other potential applications exist where hardfacing can improve service life, increase production, reduce maintenance and down time and cut production costs. New equipment designs and new process techniques are sound bases for progress in the cement industry. But there is still much progress that can be made through improvement of the processing tools already developed.

END

**HOW TO SHY AWAY FROM
HIGH CONVEYING COSTS**



**... LOOK AT THE
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the upper section of the Airslide, installed on an incline, the degree of slope depending upon the material to be conveyed.

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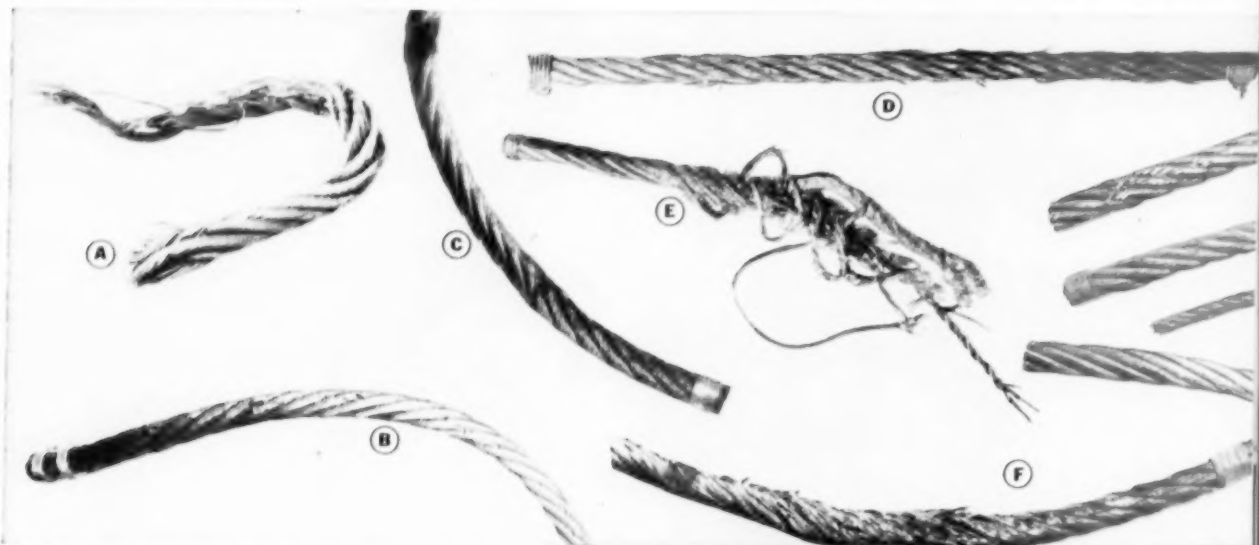
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ROCK PRODUCTS, July, 1957

97

Tuffy[®] Wire Rope Tips



Tuffy gives you a quick run-down here on some of the mortal enemies of wire rope — the abuses that quickly ruin rope efficiency or end its life abruptly long before you have had the service you paid for.

Even the best wire rope is a sitting duck for the enemies which won against the wire rope pictured on these pages. When you avoid or eliminate them you make important gains in longer rope life, better service and greater economy. Remember, your Tuffy distributor will be glad to work with you against these and other wire rope hazards.

It's the "end of the line" for wire rope when these things happen:

A. Mangled in a wedge socket. Here's the result of improper socketing. This fatal rope injury was caused by a poorly designed or worn out wedge socket. Failure at the dead end can damage other sections of the rope.

B. Rusty road to ruin. Rust — No. 1 enemy of steel — takes a heavy toll in wire rope life. It's an insidious, silent type of killer, often doing irreparable damage before it's even noticed. The one-strand break shown above resulted when the rope was allowed to become rust-bound through lack of lubrication. With other conditions ideal, tests show properly lubricated rope has up to 10 times the life expectancy of dry rope.

C. The crushing blow. The Sunday punch for this piece of wire rope was delivered by a tractor cleat — just one of many crushing injuries that result when wire rope is run over or banged into by a hard, sharp object. Even the best rope is no match for this kind of mistreatment.

D. Strangled by misfit sheaves. When the bearing surface of a

Tuffy Special Wire Ropes are tailored to special use. Ordering is easy:



Tuffy Scraper Rope

Moves more yardage per foot because **Tuffy Scraper Rope** is specially built to take the beating of extreme drum crushing abuse. Flexible, withstands sharp bending, hugs sheave grooves and winds snugly and smoothly on drums. High resistance to load shock on slack line.

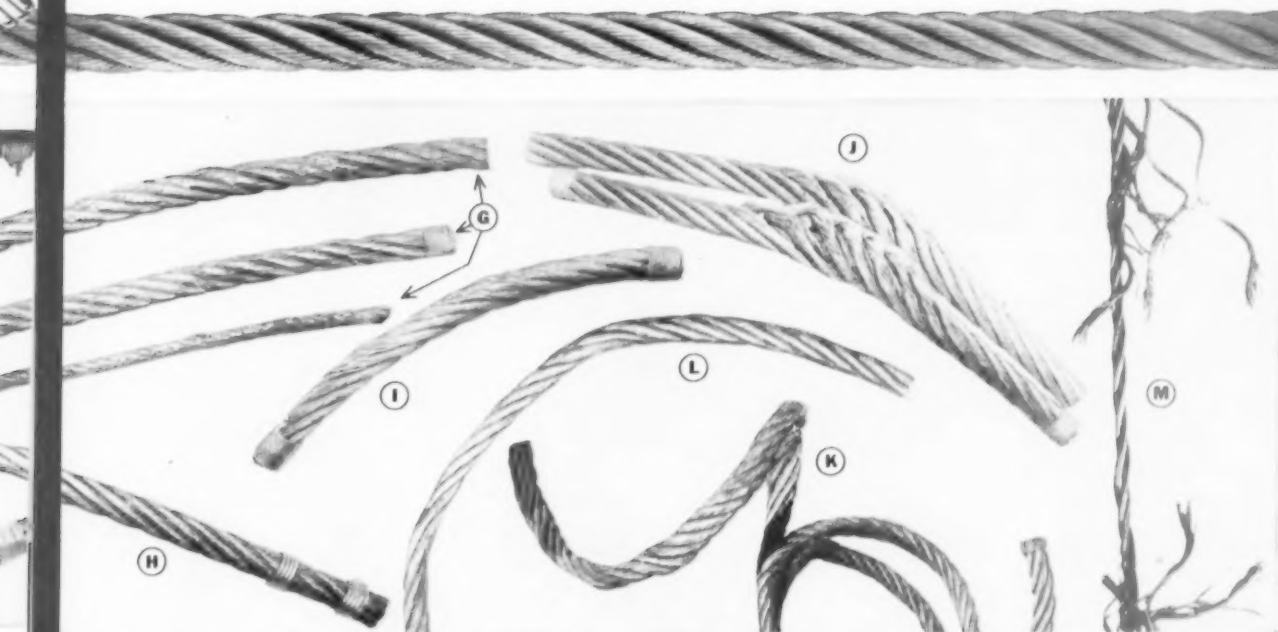


Tuffy Dragline Rope

A longer wearing line for all dragline operations. Special abrasion resisting construction which also gives extra flexibility. **Tuffy Draglines** also spool better, ride better on grooves and hold tightly to drums when casting. Consistently dependable in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.



How wire rope is crippled and killed without a fighting chance



sheave is too small for the rope diameter, pinching action quickly destroys the rope especially when it is overloaded. The one shown above was knocked out in just 1½ hours of service.

E. Apparent suicide! This rope jumped out of sheave and was soon destroyed by pulling around the shaft. Actually it was a case of sudden slack which threw the rope out of the sheave.

F. This rope came to an untimely end by operating over a sheave that did not turn. Note the exceptionally heavy abrasion on one side of the rope.

G. Victim of "the bends." Excessive bending soon wears out rope. Generally, more flexible ropes are used as bending stresses increase (with decrease in tread diameter of sheave or drum). If a rope is operated on a sheave too small for its bending characteristics, early failure is certain. Through an exhaustive series of bending tests, Union engineers have compiled data that you can use to be sure you get the rope construction that will give you the longest service life. Ask about it.

H. On the "blink" from a kink. This open kink resulted from mishandling of wire rope. Guard against kinks by proper winding on the drum. Never pull a loop smaller; always enlarge it, then straighten out the rope.

Crushed and worn from "beatings on the drum." Drum wear gives wire rope severe punishment even under normal operating conditions. This wear is found at the cross-over points and at the flange. Excessive drum crushing results from operating on too large or too small a drum. Here are typical "drum beatings":

I. Cross-over wear

K. Drum-crushing on over-sized drum

J. Cross-over crushing on drum

L. Drum-crushing on under-sized drum

Although drum wear cannot be eliminated, its effects can be greatly reduced. Under properly engineered procedures, two and three times the service can be obtained from the same line. Union Wire Rope engineers will help you with this problem. Get in touch with us for more information.

M. Overloaded — soon exploded. Wire rope is "prescribed" for a given use on the basis of breaking strength plus a safety factor of 4. The grade of steel, type of construction and size of the rope determine tensile strength. It must be properly related to the loads it will carry, or expensive and dangerous early failures are likely to occur.

Just say **Tuffy** give length and size, and forget complicated specifications.

Tuffy Slings and Hoist Lines

Here's a team that cuts hoisting and down time costs in all types of materials handling.

Tuffy Slings are made of a patented, 9-part machine-braided fabric that stays extra flexible, and isn't materially damaged by knotting or kinking.

Tuffy Hoist Line is a special construction with the extra flexibility and toughness for longer service life on overhead cranes, derricks and clamshells.

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Long after ordinary ropes are worn out, Tuffy Dozer Rope has the stamina it takes to keep on handling the blade. 150' reels mounted on your dozers let you cut off worn sections without wasting good rope. This unbeatable combination piles up sizeable savings on dozer rope costs.



Your Tuffy distributor will help check your equipment

Condition of equipment is a big factor in longer rope life and greater economy. Your Tuffy distributor will help you check equipment and operating conditions to make sure everything is in your favor for getting the greatest service out of your Union wire rope. Ask him to lend a hand in a thorough inspection. He'll be glad to do it. And if there are still knotty problems, Union Wire Rope Corporation engineering department will help further.

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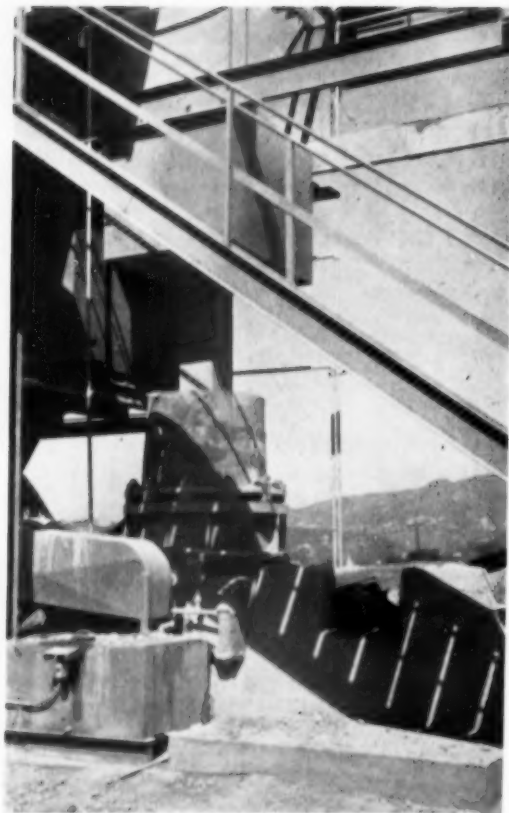
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Overall view of crushing and screening plant. Material flows from dump hopper at extreme left toward shipping area at right

Highly flexible plant is . . .

DESIGNED FOR EXPANSION



Secondary cone crusher with foundation in place beside it for another crusher

FLEXIBILITY TO EXPAND and straightline flow of materials are the keys to the high efficiency of the new gravel processing plant of Santiago Aggregates, Inc. Capacity of the plant now is 175 tph., but it was designed to be doubled whenever additional production is needed. Only a small additional investment for another crusher, screens and chutes will provide 350 tph. capacity. Ralph Welch, president, feels sure that expansion will be made within the year.

The company is developing a tract of about 300 acres in the dry bed of Santiago Creek, near Orange, Calif. This location provides ready access to the booming Orange and Anaheim districts, and the aggregate it produces for the ready-mix and bituminous-mix plants in this area helps to support rapid southwestern growth of Los Angeles.

Gravel is dug with a 2½-yd. shovel and loaded into 26-ton bottom dump trucks. The trucks dump into a concrete hopper fitted with a reciprocating plate feeder to feed the gravel to a vibrating scalping screen. The screen takes off the plus 1¾-in. gravel to be crushed in the primary jaw crusher.

Please turn to page 102

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Washing and screening tower in foreground with sand classifier, crushing tower in the background. Towers have been designated to handle additional equipment when plant production is increased

Design for expansion

continued from page 100

The primary crusher and the scalping screen can handle 350 tph. When this capacity is needed it will be a simple matter to increase the speed of the reciprocating plate feeder by changing the ratio of the chain drive.

Through-screen material drops down to a belt conveyor where it forms a cushion for the crushed gravel as it drops down from the crusher. The 30-in. inclined belt conveyor carries the crushed gravel in a straight line to a vibrating screen over the secondary crusher. All plus 1½ in. is scalped off and crushed in a 36-in. cone crusher.

Another secondary crusher will be set in place on an existing foundation when additional production is called for. The structural steel has been designed to take a second vibrating screen with its chutes and supports. However, the existing screen is now operating below its maximum capacity and may be able to handle the increased load as long as the pit run of gravel does not yield more of the larger sizes.

Controls for the crushing and screening plant are located on a platform in this tower above the crusher. Here the operator has a clear view of the straightline flow of materials from primary crusher to storage piles. According to Howard McClintock, plant superintendent, this whole operation can be supervised by one man in the tower.

When the crushed gravel from the cone crusher is ready for sizing it is conveyed to the screening tower on an inclined belt conveyor. Two double-deck vibrating screens are mounted in the tower,

one above the other. Water sprays take off the minus 3/16 in. sand and sluice it to a 60 in. spiral sand washer at ground level. Washed sand is stockpiled over a concrete reclaim tunnel which runs parallel to the crushing and screening plant.

Overflow with tailings from the sand washer goes to one of three settling ponds. While one pond is being filled, another is being dug out with a clamshell bucket, and the third supplies settled water for the continuous operation of the plant. The rate of settling has not been as great as desired ever since a family of wild ducks arrived.

The top deck of the top screen scalps off any plus 1½ in. gravel and a conveyor returns this oversize to the top of the secondary crusher. The screens produce three sizes of gravel for storage, and these are stacked out over the reclaim tunnel.

Large gravel, 1½ x 1 in., from the second deck of the top screen is sent to storage on a 20-in. wide inclined belt conveyor. The next smaller size, 1 x ¾ in., is stacked out on a 20-in. wide belt, while the ¾ x 3/16 in. goes on an 18-in. conveyor.

All of these belt conveyors are oversize for the job they are doing, and are operating at as low speed as possible to conserve their life. The speeds will be increased with the increased capacity, but only enough to handle the greater loads on each belt. Changes in the ratio of the chain drive from the reducer to the head shaft of each conveyor are relatively inexpensive, and a wide range of belt speeds can be easily and quickly produced in this way.

The reclaim tunnel is fitted with 14 segmental gates under the piles of gravel and sand. The gates

Please turn to page 125



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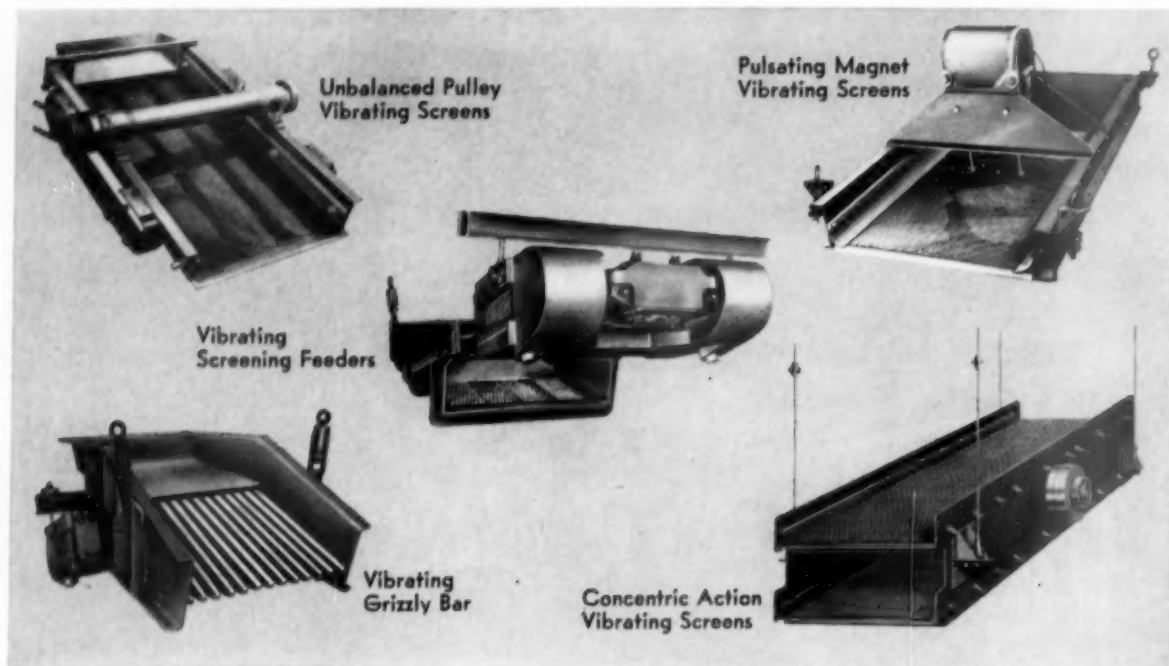
extra profits from any salvage value and better employee and community relations. And Pangborn offers a complete line of dust collectors for all jobs.

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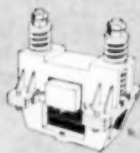
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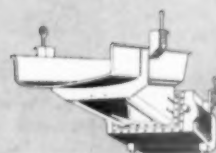
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Part 2

The efficiency of ball mills can be improved

Some preliminary considerations concerning the design of an inner lining of a ball mill

By GEORGE J. HALBART and
VICTOR F. FREYMANN*

The surface of the lining of a tumbling mill should provide the charge of grinding balls with an adherence factor greater than a certain given minimum. The authors showed how to calculate this minimum in the June issue of ROCK PRODUCTS. Here in Part 2 they shall attempt to find the most logical solution to the problem of selecting the inner profile of the lining of a ball mill.

ANY GRINDING BODY which is a part of the compact mass, even though it is not in direct contact with the lining, may be considered as if it were in contact with the lining of a mill of a smaller diameter, as the subadjacent balls drive it as a lining would. It would be useless to insure that the balls in contact with the real lining are driven efficiently if the ball to ball adherence in the mass is insufficient.

If the balls placed in a mill are all of uniform and constant size, it is possible to devise linings which provide an effective lining—to-charge friction coefficient f equal to 1.41, and an adherence coefficient between balls which would decrease

progressively, but would nevertheless still be $\mu = .7$ at a distance from the lining equal to

$$R \left(1 - \frac{1}{\sqrt{2}}\right) = .3 R, \text{ where } R \text{ is inner radius of mill.}$$

Our theories here are based on the use of uniform balls. They lead to the adoption of linings—the dimensions of the contours of which depend on the size of the grinding bodies. In using dissimilar grinding bodies the selection of the lining must be based upon the average size of the grinding bodies.

The practice of classifying the grinding bodies by size throughout the length of the mill, gradually decreasing from feed end to outlet end, enables us to make most of our theory. Thus the lining will have to be proportioned at each spot according to the sizes of the bodies. We shall show that the classification of grinding bodies is favored by the lining we suggest.

The first condition is that the profile of the lining must not hamper an arrangement of the balls contained in the mass, and ensure maximum com-

Please turn to page 106

*Mr. Halbart is Managing Director of Les Fonderies Magotteaux Ltd., Vaux-Liège, Belgium; and Mr. Freymann is Head, Technical Studies Dept., of the same firm.

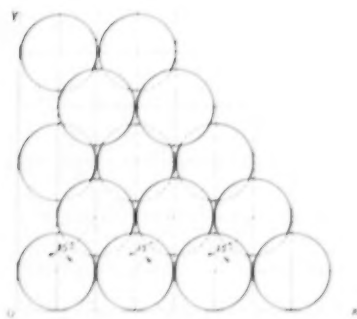


FIG. 7A

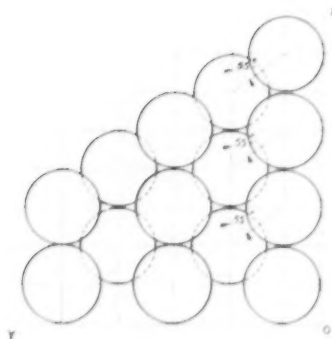


FIG. 7B

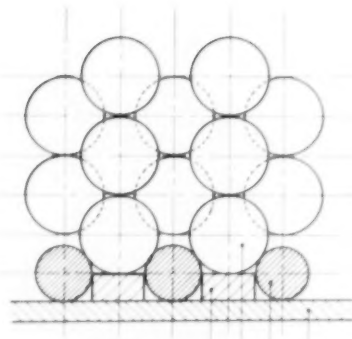


FIG. 8

Ball mill efficiency

continued from page 105

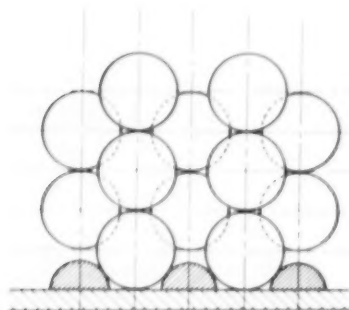


FIG. 9

pactness and density of the mass. The two geometrical arrangements of balls of identical diameter which ensure maximum average density are the regular tetrahedron and the square base pyramid.

The force of gravity and the centrifugal force exerted in a mill, (which operate in the same direction at the place where the balls are positioning themselves), the shocks of ball against ball and the vibration of the machine work together to ensure a compact positioning of the balls. The profile of the lining must act as support for a layer of balls in one of the two compact arrangements.

A smooth lining allows for either arrangement since it favors the arrangement of the plane layers in a direction parallel to the lining. Any lining with asperities, the purpose of which is to force balls into taking up their position in the first of these plane layers, works the same way.

The positive part played by the lining in positioning the balls is to orient one of the compact piling arrangements. If the plane layers of balls

are not to be parallel to the lining, latter can be neither a smooth lining nor a lining with asperities.

The second condition is that the adherence of balls to subadjacent balls, and of balls adjacent to the lining itself, must be as great as possible.

In the first part of this paper we showed how to determine the minimum value of the friction coefficient required to eliminate sliding movements. We also stated then that allowance should be made for a high safety factor. We could determine, by a similar method, the minimum friction coefficient required between the layers of balls further away from the lining.

Fig. 7a shows a compact arrangement of balls stacked up as a square base pyramid. In this figure, the axis OX represents the surface of the lining. The first layer of balls is horizontal and parallel to the X axis.

We will refer to the angle between a vertical and the vector joining center of any given ball to the center of the ball which rests on it as the **interpenetration angle**. The greater the depth to which a ball penetrates between subadjacent balls, the greater the angle of interpenetration.

This angle is also the angle of collapse of a pile of balls arranged as shown here, as well as the angle of friction of any layer of balls against another layer if they are subjected to a thrust which would move them horizontally. In our example, the angle is 35 deg. If the surface of the lining has a number of asperities fitted between the balls of the first layer, but without modifying the existing arrangement, the adherence of that first layer to the lining is improved, and the adherence of layers above it are in no way affected.

If the arrangement shown in Fig. 7a, turns 90 deg. in the plane which contains that figure, axis X becomes a vertical axis, and we then have Fig. 7b in which the surface of the lining is represented by axis OY.

The compact arrangement has not changed but the interpenetration angle has now increased from

Please turn to page 110

GET HIGH QUALITY AGGREGATE from low grade sources

WEMCO HMS (Heavy Media Separation) can remove deleterious material such as shale, chert, soft-stone, wood and coal from low grade deposits. The finished product is specification aggregate universally accepted for concrete that must stand up under severe outside exposure. The cost of HMS treatment can be far less than the transporting of material from more distant sources.



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First Thomas

General view of sand and gravel pit operation of John B. Lagarde, Inc., Anniston, Alabama—one of the largest and more modern producers of aggregates and concrete products in the South.



BORN - 1948

IN THE BEGINNING

This is the story of the birth and life of the first Thomas Durable Dredge Pump. It was installed late in 1948 in the aggregates plant of John B. Lagarde, Inc., Anniston, Alabama.

It was new and different in design and made of Genuine Thomas NI-HARD—a radical departure from the conventional Manganese Steel sand and gravel pump which it replaced. This original Thomas Pump now 8½ years old is still in use because the Lagarde organization has found it to be far more DURABLE, more EFFICIENT and more ECONOMICAL in operation. It is pushing approximately 175 tons of saleable sand and gravel per hour through an 8" line, against a static head of 90 feet and a total head of 140 feet.

Designed specifically to be made of this MODERN, LONG-LIVED, ABRASION RESISTANT MATERIAL, this Thomas Pump's extra long life and minimum need of repairs has resulted in 8½ years of service which



Lagarde officials say no other pump has ever equalled in their plant. The Manganese Pump is still idle simply because it can't compete cost-wise with the more modern and more efficient Thomas Pump.

The four Lagarde Company men shown at the right were present on this momentous occasion—the birth and development of this badly needed, more modern and more efficient and durable pumping equipment. In fact they made

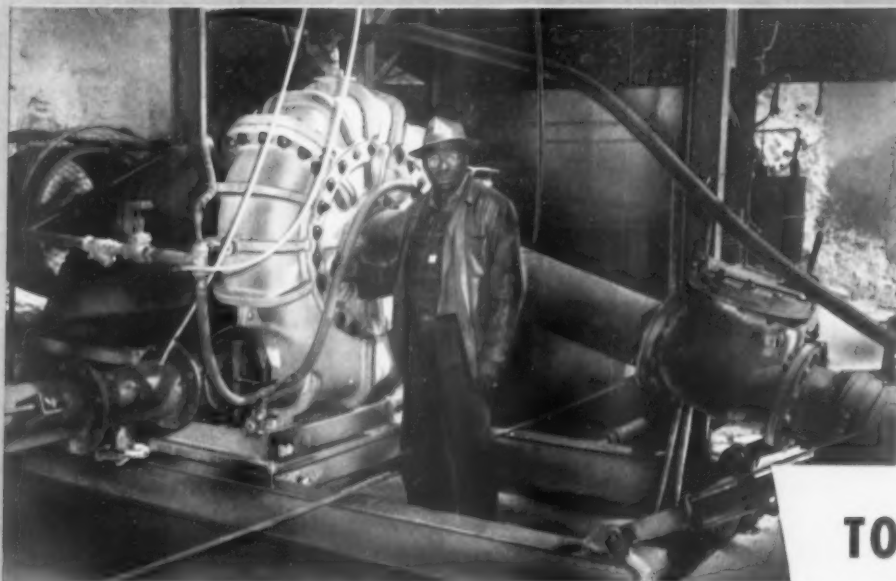
many suggestions and were very helpful in perfecting it. Today in 1957 they are naturally proud to have had a hand in its development for there are now several hundred Thomas Pumps making similar records for efficiency, long life and economy in all sections of the United States.

Now read what they have to say after 8½ years experience with the first Thomas Pump!

THOMAS FOUNDRIES, INC., . . .



Durable Dredge Pump



PUMP OPERATOR, Robert "Coke" Brockman (left): "I have operated three different makes of pumps during my many years with John B. Lagarde, Inc. I would rather run pumps than work on 'em—that's what I like about the Thomas."

TODAY - 1957

WHAT THEY SAY NOW

VICE PRESIDENT AND GENERAL MANAGER, J. N. "Jimmy" Gann: "From almost every state in the United States, we have had many sand and gravel operators come to see our unusual operations in which we hydraulic sand and gravel into a sump and then pump it out of the pit. In highly recommending Thomas Pumps, we feel we have done these visitors a favor and we understand many of them have since installed Thomas Pumps."



PLANT FOREMAN, R. J. "Dick" Medders (right): "If all of our sand plant equipment was as durable and dependable as our Thomas Pump, my job would be a bed of roses."



SUPERINTENDENT, Arthur Sword (left): "Even after 8½ years, we continue to marvel at the extra long life of our Thomas Pump. But when parts finally are needed, Thomas service is excellent. We have NEVER BEEN DELAYED OR DOWN due to failure to receive parts and service."

THE INEVITABLE CONCLUSION

YOU CANNOT BUY AT ANY PRICE, A MORE DURABLE PUMP FOR SAND AND GRAVEL THAN A THOMAS—YOU CANNOT BUY ANOTHER PUMP THAT WILL MAKE YOU AS MUCH MONEY.

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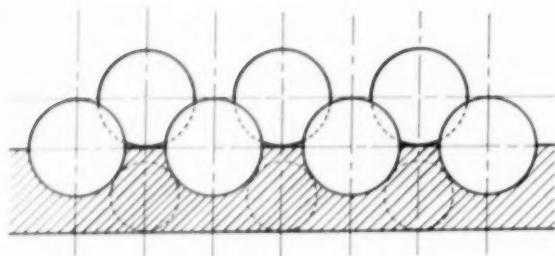


FIG. 10

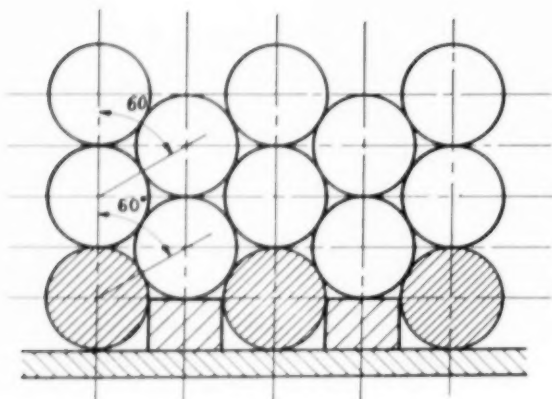


FIG. 12

Ball mill efficiency

continued from page 106

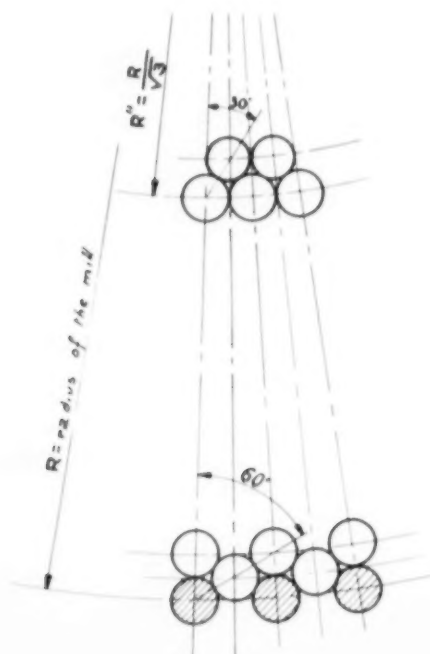


FIG. 13

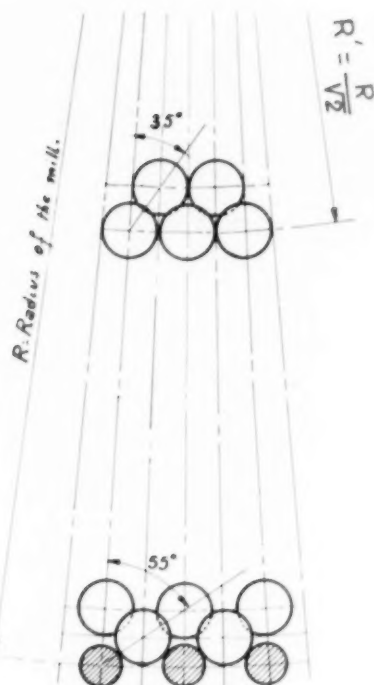


FIG. 11

35 to 55 deg. Adherence between the various layers has increased accordingly, assuming that the layers are still subject to horizontal force.

In the first case, the compact layers of balls were horizontal. In the second case, these compact layers are vertical, and the horizontal layers are no longer compact.

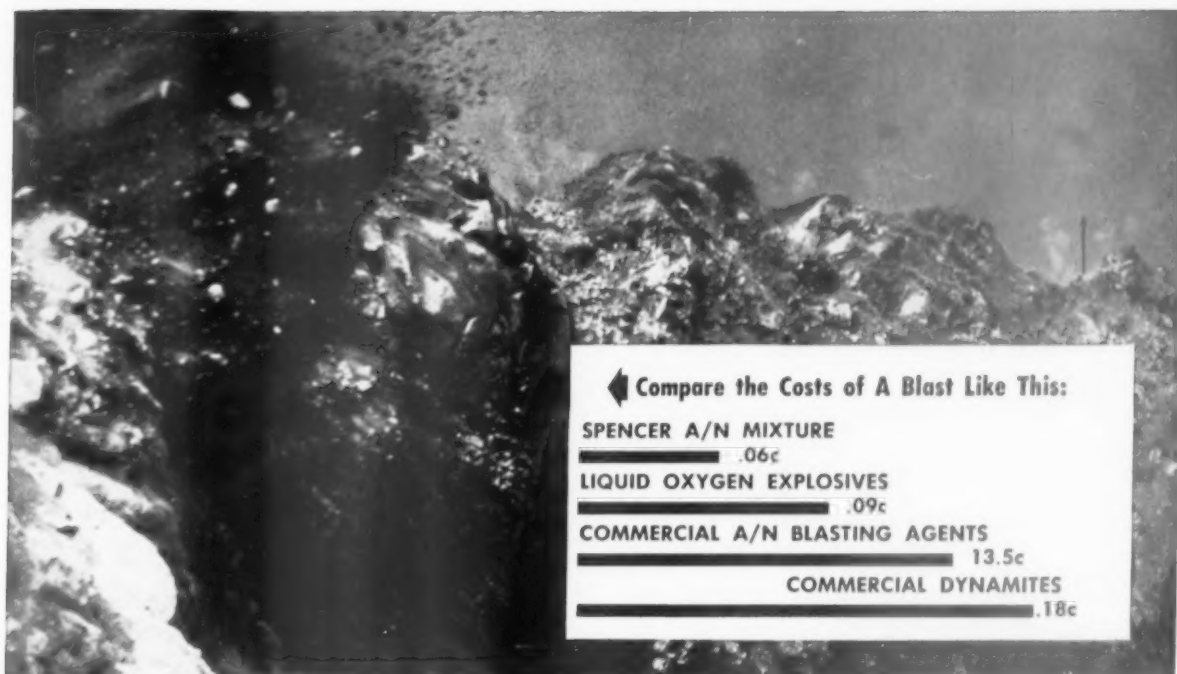
The inner profile of the lining should thus induce the formation of plane layers passing through the axis of the ball-mill. We still have the two arrangements of balls which ensure maximum compactness but the surface of the lining no longer contains the triangular or square bases of the tetrahedrons or pyramids.

With a square base pyramid, the angle of collapse μ of a pile of identical balls is equal to 55 deg. ($\text{tg} \mu = \sqrt{2}$).

A tetrahedron arrangement can be realized in the same way.

Where compact layers are horizontal, the angle of collapse of a pyramid arrangement may reach 45 deg., provided the diagonals of the square bases are oriented in the direction of rotation. That is the maximum that can be achieved by a lining with a pitted surface, and we will see in Part 3 of this series that in a mill, where the surface is cylindrical and not plane, an arrangement of this kind can not be achieved.

END



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and gives better fragmentation — yet stores and travels safely!**

You can cut your blasting costs with Spencer Prilled Ammonium Nitrate. A Kansas user, the Pittsburg and Midway Coal Company, cut \$45,000 from its explosives bill in just one year! A rock producer reports net savings of \$25,000 on a job involving about a million cubic yards of rock.

Spencer prills blast better because their spherical structure offers an increased surface area. This extra area produces more explosive speed and energy—about $\frac{1}{4}$ more, according to recent scientific investigations.

You get better fragmentation, too, with Spencer Prilled Ammonium Ni-

trate. This means you can move as much as 25% more material.

Mixing is never a problem with free-flowing Spencer Prilled Ammonium Nitrate. Shipped in polyethylene-lined bags, Spencer prills resist caking and help assure a tightly-packed mixture. In even the simplest mixing operations, round Spencer prills get a better coating of carbonaceous material. And that means a better blast.

Safe and easy to handle, Spencer Prilled Ammonium Nitrate is not cap sensitive, either by itself, or in carbonaceous mixture. In laboratory tests, rifle bullets were fired repeatedly into

these mixtures without detonation. With dynamite, the same test produced violent explosions every time.

Also, it costs less to ship Spencer Prilled Ammonium Nitrate. That's because prills are so safe they can be shipped at ordinary freight rates rather than at the rate fixed for explosives.

If you, too, want to cut costs and increase your blasting efficiency, let us help you develop a low-cost blasting program with Spencer Prilled Ammonium Nitrate. Write or phone Spencer Chemical Company, Dwight Building, Kansas City 5, Missouri, BALtimore 1-6600.

SPENCER CHEMICAL COMPANY

610 Dwight Building • Kansas City 5, Mo. • BALtimore 1-6600

Zoning

continued from page 69

of this type of operator. Zoning restrictions definitely will operate to the advantage of the established producer in such instances.

On the less desirable side, many rural zoning ordinances lack a long-range correlated plan to control the character and extent of urban dispersion. As a result, land utilization is often decided on a day-to-day basis amid the clamor of highly vocal complainants swayed primarily by emotional influences. Producers should insist on a long-range program that will best serve their interests as well as those of the public. Here are some other questions the producers should ask themselves when faced with enactment of local zoning laws:

Is the ordinance prohibitive or permissive? A zoning board may set forth all land uses that are prohibited, or it may specify only those uses which are permitted. Ordinarily the producer should urge a permissive type of ordinance that recognizes the essential nature of his contribution to the community. Reservation of sand and gravel deposits near the community should be included in the ordinance, since the goal of zoning is to reserve land for its highest and most appropriate use. To achieve this, the producer should be prepared to show acceptance of responsibility for rehabilitating depleted deposits, so they can be restored to some valuable use and remain a source of tax income to the city, county or state.

Does the zoning plan apply to all land within the zoning board's jurisdiction? If not, it constitutes an unreasonable effort to restrict certain land uses in violation of the authority granted. Not only should the zoning plan apply to the whole jurisdiction, but it should apply indiscriminately within each zone. A zoning plan that attempts to zone only parts of the jurisdiction is called spot zoning. It is advisable to prevent the enactment of spot zoning rather than be burdened later with the trouble and expense of court action for relief.

Is the zoning board made up of engineers, planning experts, lawyers and others who are trained to deal with particular problems that arise before a zoning board? If not, many difficulties are likely to arise. Citizens unfamiliar with zoning problems may not be capable of equitable administration. Frequently, other occupations requiring their full time and attention cause the neglect of their du-

ties to the zoning board. Worst of all, their decisions on a particular problem may be influenced by personal prejudices; objective analysis may be impossible.

Are performance standards required? They should be, but only if reasonable and equitable. Performance standards attempt to regulate hours of operation, noise, access from public roads, rate of water use and other elements involved in production. A good zoning ordinance will coordinate everything involved in the proper development of the community; reasonable regulation of performance, insofar as it pertains to the functioning of this development, is desirable and offers protection against community ill will caused by irresponsible and itinerant operators. Regulations, however, that conflict with other ordinances not connected with zoning should be avoided. For example, a zoning ordinance that attempts to regulate the use of sewers or the pollution of streams may usurp the authority of some other law, frequently one of more authority than the zoning ordinance.

What is the status of nonconforming uses? Many sand and gravel producers with large reserve deposits have been lulled into an attitude of indifference toward the problem of zoning because of the generally accepted doctrine of nonconforming uses. This means that if the use to which your property is now dedicated doesn't conform with a zoning plan adopted subsequent to the existence of the operations, nonconforming use may continue. It may come as a shock to learn that this doctrine is being openly, forcibly and successfully challenged. Even the Chamber of Commerce of the United States said flatly in a pamphlet: "Unless specifically prohibited by the state enabling act, there is nothing illegal in regulations which require the termination of nonconforming uses, provided they are reasonable."

The opinion that nonconforming uses would eventually die out if left alone has been disproved by experience. This has given impetus to elimination of nonconforming uses in the ordinance itself.

Amortization is a commonly employed means of eliminating pre-existing, nonconforming uses. At the end of the amortization period—which is alarmingly short in many cases—the nonconforming use must be terminated and the property converted to a use conforming with the regulations.

The nonconforming use problem is best avoided by constructive action at the time the ordinance is being drafted. If it becomes inevitable that an

Please turn to page 120

MORE WORK-ABILITY

WITH THESE

NEW "Euc"⁰⁰

REAR-DUMPS



*for construction, mine,
quarry and industrial work*

With overhung engine type tractors and full 90° hydraulic steering, these two new Euclid Rear-Dumps have excellent maneuverability for close quarter work and accurate spotting at loading and dumping areas. Big tires provide extra traction and flotation for soft fills and difficult hauls. The low over-all loading heights and rugged construction permit easy loading with all types of equipment. Smooth bodies with 3-stage, double-acting Euclid hoists assure quick shedding of loads.

Downtime and maintenance costs are held to a minimum as a result of the easy service accessibility of all major components. Interchangeability of the semi-trailer rear dump bodies with 7 and 18 yard scraper bowls provides extra flexibility for changing job requirements.

Your Euclid Dealer has detailed information on these versatile "Eucs" as well as other Rear and Bottom-Dump models, Scrapers and Crawler Tractors ... have him show you why *Euclids are your best investment.*

EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

THE
S-7

REAR-DUMP

12 tons payload ...
11 cu. yds. heaped ...
143 h.p. ...
18.00x25 tires ... top speed
loaded of 26.5 mph ...

Torqmatic Drive



AND THE

S-18

REAR-DUMP

35 tons payload ...
32 cu. yds. heaped ...
300 h.p. ... 27.00 x 33 tires
Torqmatic Drive



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



The desert beckoned . . .

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15 ft.	9 in. 70-percent alumina
51 ft.	9 in. chrome periclase
30 ft.	9 in. 70-percent alumina
54 ft.	9 in. 42-percent alumina
197 ft.	6 in. 42-percent alumina
37 ft.	6 in. Heat and wear resistant in chain section
66 ft.	No lining in feed end

The hot end of each kiln discharges clinker to an inclined grate cooler where the temperature is reduced from about 2,900 deg. F. to about 200 deg. F. This abrupt air cooling produces a desirable high-glass content in the clinker.

Low-pressure primary air is introduced into the hot end of the cooler and then drawn into the kiln. By improving gas ignition in this way, fuel consumption is greatly reduced.

Other refinements in cooler design in the Cushenbury installation include:

- Ten-degree slope of the cooler bed which helps to eliminate flooding of fine materials and reduces the roof height.

- Improved distribution of air to the kiln and to the vent stack with flat roof design.

- Positive control of the vented air through automatic control of the damper in the stack by pressure in the cooler.

- Smooth action of the grates at all speeds by balanced crankshaft drives.

- Spring-loaded sliding rotary seals to prevent loss of pressure or dust around shafts and axles.

Clinker is discharged from the coolers at low enough temperatures to be handled on belt conveyors. Two belt conveyor systems, one for each kiln, carry the clinker to the storage area. About 40,000 bbl. of clinker can be stored and clinker is distributed in this area with a pair of traveling belt trippers, one above the other. In this way clinker from both kilns can be distributed and blended at the same time.

After the clinker has been mixed with gypsum, ground in the mills and collected in the air separators, the finished cement is pumped to storage silos. Each 30 x 75-ft. silo has an estimated capacity of 12,000 bbl. of finished cement.

Cement is reclaimed from storage by Airlides and bucket elevators and can be delivered either to the bulk loading dock or to the pack house. In the pack house a pair of four-spout packers are in use and each packing machine is served by a flat belt conveyor. The belt conveyor is reversible and can deliver sacks to a truck-loading platform or to a box car loading conveyor. This unit is a "snake" conveyor, made up of parallel strands of wire

springs, which can be turned and moved to store bags in the far corners of the box cars.

Because of the remote location of the Cushenbury plant, service facilities and standby equipment have been designed to make the plant as self-sufficient as possible. There is a modern, completely equipped, air conditioned office building, a warehouse and a machine shop.

A first-aid room has a trained nurse in attendance, and an ambulance is available.

A fleet of 34 new trucks serves the plant to deliver finished cement to the southern California market. There are 29 bulk haulage units with tractors powered with 250 hp. diesel engines. There are five new flatbed trucks for sack delivery.

Lightweight aluminum bodies permit each single hopper bulk truck to handle a payload of 143 bbl. of cement, contrasted with only 120 bbl. in the older types. Lightweight construction of each flatbed truck allows a load of 580 sacks, compared with only 500 in other models.

With the addition of these trucks to their fleet, Permanente Cement Co. now has the largest company-owned truck fleet in the entire portland cement industry.

A garage is equipped and staffed for service and maintenance of this fleet of trucks, cars and engines. A mobile lubrication truck provides pressure lubrication service for units anywhere in the Cushenbury plant.

A gas-fired boiler provides auxiliary steam, and there are tanks for auxiliary gasoline, oil and water. Water is obtained from two deep wells and stored in a 360,000 gal. tank. A dike has been built to protect the plant from flash floods which occasionally come surging out of Cushenbury canyon.

Following is a list of the personnel at the Cushenbury plant: James G. Hansen, works manager; Arthur Rich, plant superintendent; Richard E. Sharpe, chief chemist; P. Boscrup, maintenance supervisor; L. G. Huff, purchasing agent; Paul Flood, traffic manager; Dan Hanes, shift supervisor.

Equipment used at Cushenbury

Plant layout, design and installation	Kaiser Engineers, Inc.
Primary jaw crusher, 66 x 84 in.	Birdsboro Steel Foundry & Machine Co.
Gyratory crusher, 20 in. (1)	Nordberg Mfg. Co.
Crusher (1)	Bath Iron Works Corp.
Kilns, 12 x 450 ft., gas fired (2)	F. L. Smidth & Co.

Please turn to page 116

TOURNATRACTOR is a 210 hp tractor that *runs* on rubber instead of *crawling* on tracks.

Since its introduction in 1946, this electric-controlled tractor has been used successfully in every kind of climate, terrain, material, and on every type of tractor application, all around the world, by thousands of owners.

Their job records prove that Tournatractor

can outwork crawler-tractors by as much as 2 to 1 where job conditions allow the use of its higher speeds.

Remember, too, that for this extra speed and greater production capacity, plus all the other "bonus" Tournatractor advantages described below, you invest no more, and pay less for operation and maintenance, than for any crawler-tractor of similar power.

Does speed fit your job?

Check these advantages for your pit!

Speed on the job...

Tournatractor pulls, dozes, pushes at speeds 2 to 3 times faster than any crawler. You change gears instantly, waste no time shifting, go up to 7.2 mph in reverse.

Mobility between jobs...

Tournatractor travels job-to-job at rubber-tired speeds to 17 mph. Big, low-pressure tires drive anywhere—you need no planking or trailers—have no loading or unloading delays.

Lower maintenance...

Lubrication takes only a few minutes a shift on Tournatractor as compared to 15 minutes or more on a crawler. No cleaning of tracks, grouser, and other fittings.

Fewer repairs...

A set of tires or tracks costs about the same. But tires last 2 to 3 times longer than tracks under most conditions... without the usual maintenance expenses.

Ample flotation, traction...

Each tire grips area approximately 2 feet wide. Lugs bite

deep to give plenty of traction. Low-pressures increase flotation, absorb shocks, aid compaction.

Less loss of power...

210 hp diesel drives through dirt-sealed anti-friction bearings to free-rolling wheels. All gears and bearings automatically lubricated... all parts easily accessible.

Shifts instantly...

Constant mesh transmission eliminates delays in changing gears... saves vital momentum... gives you any gear ratio instantly.

Torque converter available...

This simple, dependable, low-pressure system provides the equivalent of an infinite number of gear ratios automatically selected to best balance load and torque.

Easier to operate...

Less jolt and jar reduces stress and strain on both operator and machine. Fingertip electric controls let operator work faster, with less end-of-shift fatigue.

Improves safety...

Low center of gravity, all-around visibility, quick response of controls make Tournatractor exceptionally safe to operate. Multi-disc air brakes have more than 4 times the braking surface of most big tractors and trucks.

Interchangeable equipment...

Bulldozer, Angledozer, Roof Rake, Snow Plow—all interchangeable—may be mounted on Tournatractor. Tilt mechanism and down pressure attachment also available.

Easy to keep busy...

Stripping overburden, pushing scrapers, cleaning up around shovels, or handling a wide variety of utility jobs around the pit, Tournatractor's speed and power will save you time and money.

Call or write us for more information on Tournatractor. Decide for yourself the advantages of this versatile, high-speed, rubber-tired tractor.

Tournatractor—Trademark Reg. U.S. Pat. Off. CT 1583 M 1



Tournatractor pulls Carryall Scrapers twice as fast as crawler tractors. Hauls more in less time.



Versatile rig combines power and fast positioning for efficient pushing, loading in any materials.



Tournatractor utilizes mobility and speed for quick clean-up around shovels and on pit floor.



LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

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Plibrico Construction



THE "pro" OF proficient INSTALLATION

Follow-thru . . . that's the something extra which distinguishes the expert, be it in golf, tennis, fly casting, or baseball.

In refractories, quality products and capable engineering are fine, as far as they go. But for that something extra, your Plibrico distributor follows thru with his highly skilled, specially trained installation crew. The simple fact is they know exactly what they're doing when they install refractory linings in calcining, drying, and processing furnaces. And they do it well.

Proficient installation makes your Plibrico distributor's service truly complete. Products, engineering, and installation are yours from a single supplier, with responsibility undivided. Next time have the complete job done by your Plibrico man.

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ENGINEERING
CONSTRUCTION**

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Plibrico Sales & Service in Principal Cities

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The desert beckoned . . .

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- Tube Mills,
9½ x 36 ft. (3) F. L. Smidth & Co.
- Clinker coolers, grate-type (2) Fuller Co.
- Dust Collectors Pangborn Corp.
Research-Cottrell, Inc.
- Kiln controls . . . Swanson Engineering & Mfg. Co.
- Kiln burners Coen Co.
- Control panel Westinghouse Electric Corp.
- Air separators (3) Sturtevant Mill Co.
- Motors Westinghouse Electric Corp.
- Pumps A. R. Wilfley & Sons, Inc.
- Screens and idlers Hewitt-Robins, Inc.
- Belt idlers Hewitt-Robins, Inc.
Chain Belt Co.
Joy Mfg. Co.
- Slurry screens and launders Dorr-Oliver, Inc.
- Car puller Stephens-Adamson Mfg. Co.
- Waytrol feeders Jeffrey Mfg. Co.
- Shovel, #110B 4½
cu. yd., electric (1) Bucyrus-Erie Co.
- Diesels Cummins Engine Co., Inc.
- Conveyor belts B. F. Goodrich Co.
The Goodyear Tire and Rubber Co.
Quaker Rubber Corp.,
Div. of H. K. Porter Co.
- Belt, truck and rail scales Fairbanks-Morse Co.
- 15T gantry crane (1) Moffet Engineering Co.
- Bridge crane (3) Harnischfeger Corp.
- 16T rear dump trucks (3) General Motors Corp.
- Bulk trucks (29) Kenworth Motor Truck Corp.
- Drills (2) Joy Mfg. Co.
- Fans New York Blower Co.
- Fans, heavy duty Westinghouse Electric Corp.
- Fans, secondary air Rees Blow Pipe Mfg. Co.
- Air slides and conveyors Fuller Co.

END



1. Fingertip electric controls

2. Point-of-action electric motors

3. Hinged body design
... no frame, no springs

4. Big, multi-disc air brakes on all 4 wheels... selective brake control locks front or back wheels, or both

7. Wide bowl, with low rear entry, makes loading easier, faster ... with less spillage

6. All-steel body ... with tri-level bottom

5. Interchangeable tires and wheels, front and rear

Cut your pit costs

with high-production Tournapull® Rear-Dump haulers

Capable of high-production in all materials, with a minimum of maintenance, LeTourneau-Westinghouse Tournapulls with Rear-Dumps give you more for your money in productive hours worked ... more in tons moved ... at lower cost. Here's why!

Simplified construction

Rear-Dump construction is radically simplified from that of conventional haulers. In place of a foundation frame and body sub-frame, Tournapull prime-mover and trail unit are hitched together by means of a rugged, high, horizontal yoke. Yoke pivots horizontally on kingpin at front ... then extends back along the sides of the bowl, where it is pivoted vertically just above and ahead of rear wheels.

Heavy-duty bowl resists shock, abrasion, and crushing damage of big chunk-rock dropped by excavator.

Big tires

There are no dual tire or mixed size problems. Big, single, low-pressure tires adequately absorb the shocks of rough off-road travel and shovel loading. Troublesome springs, spring hangers and tie-rods that require frequent maintenance and replacement are eliminated. Long-wearing tires are interchangeable all around ... one spare serves an entire fleet.

2-wheel prime-mover

Front-wheel drive and kingpin-type steer further simplify Tournapull construction. A multitude of trouble-causing parts are eliminated. No longer must power be carried back to the rear through a long drive-shaft ... with its inherent bearing, universal joint, and lubricating problems. No longer is steering handled by small front wheels subject to misalignment from "bulldozing", as they try to get out of ruts. All com-

pact machinery inside prime-mover case is readily accessible for quick adjustment, easy servicing.

Simple, safe dump action

A touch of electric switch on dashboard instantly activates point-of-action body-hoist motor. Entire dump is under power control—there is no free fall. There's no delay for hydraulic pressure build-up, no shock-loads—as with gravity dumping. You save on maintenance time, too, because there is no hoist maintenance to check ... only a few places to inspect and lubricate.

For complete information

Find out how these savings can put money in your pocket. There are three LeTourneau-Westinghouse Rear-Dump sizes to fit your requirements, with 11, 22 and 35-ton capacities. Write for information.

R-1409-M-1



LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

WHERE QUALITY IS A HABIT

Efficient engineering

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The Pacolet quarry and plant is somewhat larger than the Blacksburg operation (present capacity is approximately 500,000 tons per year) and the rock, a type of granite, is harder. Features of the Pacolet plant include scalping, sizing and rinsing stations and five 20 ft. high concrete storage bins over loading tracks. The quarry pit is 16 acres in area with a 100-ft. face.

Rock production average 2.66 tons per pound of explosives. Drilling is done for secondary shots to break up rock too large for handling.

Quarry rock is carried by four 15-ton trucks to the primary crusher, a 30-in. gyratory, where it is reduced to pieces ranging from 6 to 8 in. in diam. From the primary crusher the rock goes by two 36-in. conveyor belts to a surge pile, from which it is reclaimed and sent to a triple-deck 6 x 16-ft. scalping screen and then to a secondary crusher. The 1½-in. plus rock is reduced to 1¼-in. minus and sent back to the main surge pile.

The final 1¼-in. crushed material travels via a 24-in. conveyor to a screening and washing station, where a 6 x 16-ft. triple-deck screen separates the rock into four sizes: ¾ x 1¼, ½ x ¾, ¼ x ½ and ¼-in. down. The minus ¼-in. material is flumed off to a large settling basin where it can be reclaimed by a dragline or dozer. Some material bypasses the screen, producing a 1¼-in. minus crusher-run material, which is chuted to a surge pile. The three graded sizes are conveyed to separate piles by 20-in. conveyors.

The piles are located over a reclaiming tunnel from which any size including crusher-run can be carried by a 24-in. conveyor. Material is rinsed over a 5 x 12-ft. screen and moved to bins by a conveyor with a traveling tripper. From the bins material is put into trucks or railroad cars. Milford Carter is superintendent of Pacolet plant.

The Beverly quarry, largest of the three Campbell Limestone operations, is located on a 91-acre lease four miles east of Liberty, S.C. The original quarry at this site was established in 1894, and in 1934 was purchased by the present owners. Since the end of World War II the Campbell Limestone Co. has doubled the capacity of the plant to about 1,000,000 tons yearly.

In 1954 the company that had done exploratory borings for Campbell at the Blacksburg quarry commenced core drilling at the Beverly site. On the basis of 50 diamond drill holes it was established in 1955 that at least 5,500,000 tons of high grade rock are available.

The present quarry pit is 40 acres in area and

from 50 to 125 ft. deep. The overburden is a maximum of 30 ft. deep and is principally weathered and disintegrated granite. The material being quarried is classed as Carolina gneiss and contains about 30 percent silica. The deposit extends to an unknown depth.

Overburden is stripped with a 1½-cu. yd. shovel. Three 16-ton side dump trucks haul the overburden to a deep draw being utilized as a spoil bank.

The quarry rock is loaded into trucks by either a 4-cu. yd. electric shovel or a 3½-cu. yd. diesel shovel. Six trailers with two eight-ton compartments, built in the Campbell company's own shops, haul the rock to the primary crusher. The Beverly plant produces 12 different sizes of rock including blends ranging from sand to crusher run. Six different sizes including sand are kept in stock.

This multiplicity of sizes necessitates a complicated system of crushers, screens, conveyors, tunnels and bins. These include 32 belt conveyors, 4 tunnels and 11 sets of vibrating screens. Surge piles are fed by 16 conveyors, and 16 others carry material to and from screening, rinsing, loading and crushing stations. Belts for sand and crusher run material or wherever material tends to be sticky are equipped with rubber disc return idlers. The newer conveyors are direct drive through reduction gears instead of chains.

The water requirement of the plant is 500 gpm. This is pumped from nearby Golden Creek by a 6 x 5-in. double-action pump operated by a 200-hp. motor. The pump house also has a 35-hp. electric pump as a standby. Pressure for rock washing is provided by a booster pump. Water from Golden Creek is first pumped into a 7,000-gal. tank. Then the booster pump takes over to assure constant pressure and volume for rinsing.

The plant has a 42-in. gyratory crusher for a primary, an 18-in. gyratory for intermediate crushing and a 4¼-ft. standard and a 4-ft. short-head cone crusher for final reduction. The graded sizes of rock above ½ in. can be re-run through the short-head crusher when it is necessary to make additional minus ½-in. material.

The quarry operates a day shift only, and the final crushing, grading and storing is done on two shifts. The conveyors are of Campbell Limestone Co. design and manufacture, using equipment from several firms. A testing lab is maintained to assure a quality product at all times.

A repair shop equipped with heavy-duty machine tools is also maintained at the quarry to facilitate repairs to trucks and heavy machinery.

Four 125-ton bins, a 100-ton bin and a 75-ton bin hold the six different sizes which are kept in stock. Truck scales under these loading bins are triple beam, 50-ton capacity with a 90 ft. long platform. Recording scales nearby are used to

Please turn to page 120



"We're blasting near you"



Now you can gain better public relations in communities where you are blasting by showing an interesting, informative film, in color!

It works, too. The film, entitled, "We're Blasting Near You" has already been shown by contractors and quarry operators in many parts of the country, to audiences including PTA groups, civic organizations and service clubs.

The movie tells why blasting is necessary, and explains the steps you are taking to "be a good neighbor." It shows how millisecond delay techniques eliminate the old-fashioned, jarring explosions of the past, and

how modern blasting methods keep noise, vibration and flying rock to a minimum.

This unique film is accompanied by a kit of suggested news releases, sample speeches, safety posters and other helpful material—everything you need to conduct a successful meeting in your community. Plan now to get the important public relations benefits from showing "We're Blasting Near You." Write, telling us the approximate dates you'd like to schedule it.



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POWDER COMPANY

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Efficient engineering

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weigh all rail cars. Daily capacity of the Beverly plant is 4,000 tons.

Boyce Couch is superintendent of the Beverly plant, W. E. Vaughn is plant manager and Melvin Bolding is master mechanic. Travis Foster is field engineer for all plants. Robert Alfred is chief engineer for Campbell Limestone. Robert S. Campbell is president of the company.

Equipment List

Signal system—Edwards Co.
Drilling—Southeastern Diamond Drilling Co.
Draglines—Bucyrus-Erie Co.
Side dump trucks—Caterpillar Tractor Co.
End dump trucks—Euclid Road Machinery Co.
Power shovels—Baldwin-Lima-Hamilton Corp.
Screens—Hewitt-Robins Inc.
Gyratory crushers—Allis-Chalmers Co.
Cone and shothread crushers—Nordberg Mfg. Co.
Screens—Allis-Chalmers Co.
Pump and scales—Fairbanks-Morse & Co.
Recording scales—Streeter-Amet Co.
Plant layout by E. Lee Heidenreich, Newburgh, N.Y. and Chicago, Ill.

END

Zoning

continued from page 112

operation will not conform with the zoning regulations, and that the ordinance will not permit continuation of nonconforming uses, an amortization period should be established so that it eventually will convert the excavation site into a conforming use and at the same time provide enough time for the producer to get a reasonable return on his investment.

Whom can you look to for help when zoning problems are encountered? The producers can hire a consultant on land planning to represent their interests. They may be expensive, but sometimes this can be handled as a cooperative venture with other producers in the area. A list of qualified consultants can be obtained from the American Society of Planning Officials in Chicago. Local associations can help, and the National Sand and Gravel Association and the National Ready Mixed Concrete Association can be relied on for assistance. This assistance includes specific advice and analysis of zoning problems, as well as access to current and forthcoming Association publications on this subject and its related problems. Local

chambers of commerce often will give help. The U. S. Chamber of Commerce is on record in favor of the dedication of natural resources to the highest use to which the land can be placed. Then there are the producer's customers, who often have a potent voice in local affairs. Local contractors' organizations and state and local government agencies depending on the producer for materials can often be persuaded to help.

Producers have every right to seek and expect this help. The rock products industries make an indispensable contribution to the economy and the welfare of the nation. Last year sand and gravel production alone totaled well over 590-million tons. The country must have our products, and we must tell more people what we are doing and how we are doing it.

Unfortunately, our industries have often been the objective of rural zoning. If our industries sell the people in general and zoning authorities in particular on the obvious fact that our industries are a primary factor in the community's economic life, we can expect the reasonable and equitable treatment which we deserve, in zoning ordinances. Our industries can operate effectively only in a climate of an enlightened local opinion. The good will of the people with whom we live and work is necessary if we are to expect equitable treatment in zoning regulations.

END

Push button control

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the stock pile. These conveyors deliver to the first incline conveyor of the truck loading tower in driveway No. 1. To deliver to driveway No. 2, an electrically operated flop gate is opened by the operator at the delivery control house and the product goes to another conveyor and then on to No. 2 drive. To load railroad cars, the operator closes a second flop gate and material is delivered to boom loading conveyor for loading.

All these conveyors and gates are controlled by the operator in the control house. The complete operation of the screening plant, the crushing plant and the delivery of finished product to stockpiles is done by one operator. This is accomplished by use of the automatic control and sequencing system designed by the Hack Engineering Co. for this particular plant. The control centers are located at screen plant and at stockpile delivery center.

Primary distribution at 2,300 v. to these load centers reduces power loss in transmission over the plant area. Transformers reduce the current

Please turn to page 122



This is a complete Universal-engineered plant operating in the Limestone quarry of McDonnough Brothers, Inc. near

San Antonio, Texas. Of the Universal plant, Mr. McDonnough said, "We consider it the best engineered plant available".

**"600 tons per hour
100% passing 1½" screen
with our Universal 4650 Impact Master"**

Says Mr. James P. McDonnough, president, McDonnough Brothers, Inc., San Antonio, Texas

"WE PURCHASED a complete Universal plant, including the 4650 Universal Impact Master for our limestone crush because we consider it the best engineered plant available. And we consider the Universal Impact Master the best operating crusher.

"We have, so far, produced 600 tons per hour of 100% crush passing 1½" screen with our Universal 4650 Impact Master. We have not yet come close to the capacity limits of our new plant, but

are confident that we are equipped to crush at least 800 tons per hour.

"In 1951 we purchased a Universal Impact Master (Model 3042) for crushings mainly in 7/16" size, for limestone used in asphalt and chemicals. Continuous operation of this plant for six years has given us an excellent opinion of the worth of Universal equipment and was a determining factor in our purchase of a complete new Universal-engineered plant this year."



The Universal 4650 Impact Master. In-fed rock is reduced by a smashing blow from two rotor hammers turning in the same direction. Material moves forward and out by straight-line action.

Aggregate producers everywhere look to the Universal Impact Master for top production in all types of material. It gives them more uniform gradation . . . top quality cubical aggregate with minimum wear and maintenance. Universal equipment is engineered for the rock crushing industry by men who know rock crushing equipment.

Write for complete information on the Universal Impact Master today.



UNIVERSAL ENGINEERING CORPORATION

617 C Avenue, N. W., Cedar Rapids, Iowa

A subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois

Push button control

continued from page 120

to 440 v. from the control centers to the motors. Weatherproof wire is used in Delta-Starr expanded metal trays.

The control house for the screen plant contains a specially designed console where the operator, from one location, controls all the equipment of the manufacturing phase of the operation. A second control house handles all the loading equipment. The operator loads a truck with conveyors by pushing the buttons on the console in his control house. This automation eliminates the use of bins, high loaders or other rolling equipment.

END

Cement plant comes to market

continued from page 85

ices have been put in to support additional equipment. The clay mills and tanks are already large enough to support more kilns. By the time new kilns could be put in place, the work force would be fully trained and experienced to operate the equipment with only a few other workers.

With the booming Detroit area at its doorstep,

the Peerless organization is making sure that it can take care of present and future demands.

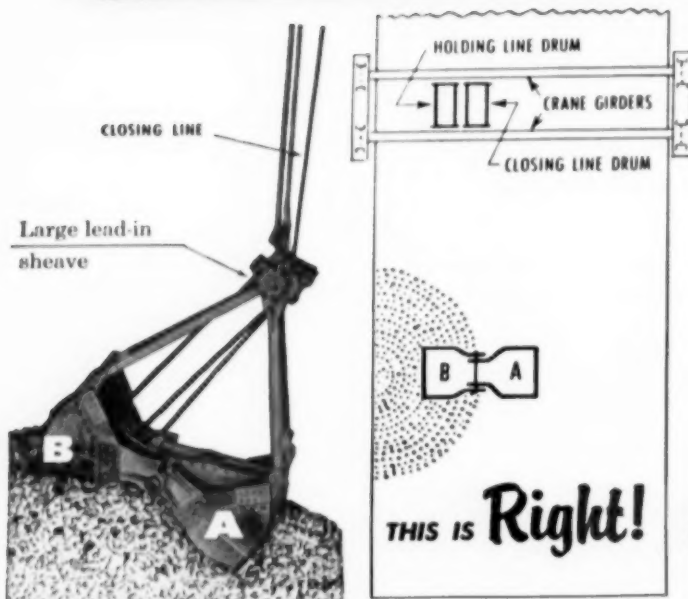
Equipment used at Peerless

Kiln—Traylor Engineering & Mfg. Co.
Rod mill and ball mills—Allis-Chalmers Mfg. Co.
Electrostatic precipitators—Research-Cottrell Inc.
Dust collectors—Research-Cottrell Inc.
Dust balling wheel—Allis-Chalmers Mfg. Co.
Reducers—Falk Corp.
Belt idlers—Stephens-Adamson Mfg. Co.
Airlides, screw conveyors, coolers and dust collectors—Fuller Co.
Overhead cranes—Harnischfeger Corp.
Bulldozer—Oliver Corp.
Transformers, motors, panel board, switchgear and rectifiers—General Electric Co.
Kiln firing control; panel board—Bailey Meter Co.
Clinker and gypsum feeders—Jeffrey Mfg. Co.
Bowl mill—Combustion Engineering, Inc.
Table feeder—Cleveland Worm & Gear Co.
Fans—American Blower Co.
Elevator—Chain Belt Co.
Attrition mill—Bauer Bros. Co.
Slag dryer—Dorr-Oliver Inc.
Layout, engineering and architectural services by Giffels & Vallet, Inc., and L. Rosetti, engineers and architects, Detroit.

END

AMAZING CABLE LIFE INCREASES

reported by leading cement companies



These increases are the result of applying the practical recommendations, graphically presented with fourteen illustrations of right and wrong bucket applications in Blaw-Knox Bulletin 2510.

This bulletin illustrates and describes proper and improper relationship between:

1. The preferred or required direction of bucket opening.
2. Location and contours of the piles of materials.
3. The position of the holding and closing drums in the overhead crane trolley.

An understanding of this relationship has invariably lead to marked improvement in cable life and bucket performance. Send for your copy of form 2510 today.



BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
Pittsburgh 38, Pa.
Offices in Principal Cities

Enter 1516 on Reader Card



Penn-Dixie's 20-ton Plymouth Locomotive transports stone and fullers earth from quarry to crusher 8 hours a day, 5 days a week.

"Fuel savings alone amount to over \$2600 a year"

Here's real economy in haulage operations: "We like our Plymouth very much . . . it is definitely faster, more efficient than the steam locomotive we used formerly," states B. B. Nall, superintendent of Penn-Dixie Cement Corp., Clinchfield, Georgia, in describing the performance of the company's 20-ton Plymouth Diesel with Torqomotive Drive.

"Over a $\frac{3}{4}$ -mile route from quarry to crusher, our Plymouth Diesel saves us more than \$10-per-day in fuel costs alone. Maintenance costs have been exceptionally low with a minimum of down-time

in more than three years of continuous operation."

Plymouth's high operating efficiency and low operating cost make hauling, switching and spotting jobs more profitable for large and small companies everywhere. Whether your requirements call for gasoline or Diesel power, mechanical or torque-converter drive, we will gladly send you complete information on a Plymouth built specifically to meet your haulage needs. Send a brief outline of your operations to: The Fate-Root-Heath Company, Dept. A-5 Plymouth, Ohio.

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PLYMOUTH
LOCOMOTIVES
in Progressive Industry
throughout the world



Superintendent A. E. Cline, Columbus Gravel Company, reports...

"SUPER-TEMPERED SCREENS Have Cut Our Screen Replacement Costs By 15 to 20%"

Using a 5' x 10' two-deck Deister Vibrating Machine, the Columbus Gravel Company, Columbus, Mississippi, produces about a quarter of a million yards of #4 to 1½" gravel per year.

This machine is equipped with Wissco Super-Tempered Precision Space Screens, according to Supt. A. E. Cline, "because Columbus Gravel is interested in long screen life and accuracy.

"Super-Tempered Screens have certainly proved that they give longer resistance to abrasion, vibration and fatigue," Mr. Cline continues. "In addition, they are easy to change and do not work loose under severe vibrating conditions."

The importance of proper grading at Columbus Gravel

is emphasized by the fact that the state highway department makes daily plant inspections to check grading accuracy. "With our Super-Tempered Screens, we never have any trouble meeting these requirements," Mr. Cline reports.

The reason for the long life and amazing accuracy of Super-Tempered Precision Space Screens is simple. It's quality—quality that's built into them at every step. Special wire is oil-quenched for extreme hardness. It's then crimped to precision standards and woven extra tightly on heavy-duty hydraulic looms to assure accurate, uniform spacing under the severest vibration.

Find out how you can use Super-Tempered Precision Space Screens to best advantage in your own operation. Write or phone our nearest sales office today.



SPACE SCREENS

THE COLORADO FUEL AND IRON CORPORATION

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CF&I OFFICES IN CANADA: Montreal • Toronto • CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

Enter 1563 on Reader Card



4534

Design for expansion

continued from page 102

are pneumatically operated and remote controlled by the weighmaster in the scale house.

When shipment of any one of the materials in the storage piles is to be made, the reclaim belt is started and one or more of the gates are opened. A remote controlled turn-spout over the four compartment shipping bin enables the operator to select the right bin in which to discharge sand or gravel. High and low controls signal the operator if the bin is too low to load trucks, and cut the power if the inclined conveyor fills the bin too full.

Trucks are loaded while standing on a 70 ft. long platform scale, and the platform is placed so that long trucks can be trimmed while on scale.

Extra precautions have been designed into the reclaim system to keep water out of the shipping bins and platform scale pit. Angles are welded to the trailing lip of each reclaim gate to gather water which seeps down through the piles above. The angles form troughs above the belt that drain the water to pipes welded to the frame of conveyor. In this way water is kept off belt conveyor.

At the discharge end of the reclaim belt conveyor, the head pulley is fitted with a rubber-blade belt wiper. This strips off moisture and sand which adhere to the belt and drops them to a chute to the ground. Any water which does seep down through the materials in the shipping bin is gathered under the duplex bin gates. Here a section of chute is mounted on rollers, and whenever a truck is to be loaded the chute is moved out of way.

The whole plant shows the result of careful planning and attention to detail that make it a very efficient operation. All switchgear and electrical equipment is located in a locked and ventilated building. A change house provides adequate facilities for the employees, while the maintenance building is well equipped to do routine maintenance on all heavy machinery in the plant.

Equipment used at Santiago

Shovel—Northwest Engineering Co.
Vibrating screens—Overstrom & Sons, Inc.
Grizzly—Overstrom & Sons, Inc.
Jaw crusher—Kue-Ken, Straub Mfg. Co.
Core crusher—Kue-Ken, Straub Mfg. Co.
Belt idlers—Chain Belt Co.
Reducers—Falk Corp.
Sand classifier—WEMCO
Platform scale—The Webb Corp.
Pneumatic equipment—Curtis Mfg. Co.
Loader—Clark Equipment Co.

END



Rock from the quarry that passes through the RCA Metal Detector, pre-set by you for your situation, is automatically inspected for tramp metal. You know the material is safe—safe for your crushers—once it's "on the other side." It's that easy! Thus, dipper teeth, drill bits, and other hard alloy parts—magnetic or non-magnetic—are brought to light! The conveyor automatically stops or the danger zone is marked, even though the trouble makers are hidden from human eyes.

An official of one large company writes: "Our Metal Detector has saved tens of thousands of dollars!" This equipment can easily pay for itself in reduced repairs, downtime, production gains. An RCA Service Company electronics technician supervises installation by your personnel. A low-cost servicing plan provides continuing maintenance.

Get complete information—Mail coupon

	<p>MARK OF RCA QUALITY</p> <p>ELECTRONIC METAL DETECTOR</p>
<p>RADIO CORPORATION of AMERICA Dept. U-206, Building 15-1, N.J.</p>	
<p><input type="checkbox"/> Please send me complete data on the RCA Metal Detector.</p> <p><input type="checkbox"/> Have representative call to survey our plant.</p>	
<p>NAME _____ TITLE _____</p> <p>COMPANY _____</p> <p>ADDRESS _____</p> <p>CITY _____ ZONE _____ STATE _____</p>	

Enter 1617 on Reader Card

Industrial minerals conference is highlight of Coal Show

THE INDUSTRIAL MINERALS CONFERENCE was the high point of the recent Coal Show of the American Mining Congress in Cleveland. It was their recognition of the great and growing importance of the nonmetallic and industrial minerals industry—of which sand and gravel production alone exceeded the tonnage of the bituminous coal industry.

The cement industry was represented by a motion picture, "The Drama of the Cement Industry," of the Portland Cement Association, and by two papers. C. A. Rowland of Allis-Chalmers studied ball mill practices, and Claiborne Van Zandt of Lone Star Cement Co. discussed the grinding circuits in this company's Nazareth, Pa. plant.

The story of how the gravel producing industry has adapted beneficiation methods to the production of high specification gravel was told by Wm. L. Price of the Keystone Div., Dravo Corp.

A number of gravel producers are now able to improve the quality of their deposit and to compete successfully with aggregates which must be transported. They have done this with the applica-

tion of heavy media separation, since the fraction of gravel which does not meet specifications usually can be floated off in the heavy media vessels.

In quite another vein, two papers showed how two major producers of nonmetallic minerals solved their mining problems after careful and exhaustive analysis of all solutions.

Robert W. Smith of the Warner Co. outlined the evaluation of alternate methods which they considered before deciding to use belt conveyor and a slope to open the 960-ft. level for production at the Bell mine near Bellefonte, Pa. This was the most advantageous method since the belt conveyor could be used to haul muck from the face to the disposal area.

At the Nichols, Florida plant of Virginia-Carolina Chemical Co., hydraulic conveying of the phosphate bearing matrix proved to be the most economical and advantageous method. C. V. O. Hughes, assistant manager of the plant, explained the difficulties of transporting about 30 million tons a year of materials from producing pits to processing plant, a distance of two to five miles.

The full texts of these and the other papers at the Industrial Minerals Conference are available from The American Mining Congress, Ring Building, Washington 6, D.C.

END

HENDRICK PERFORATED PLATE PAYS OFF!



Here's how Hendrick H Quality Perforated Steel Plate can often mean the difference between profit and loss for your screening operations:

- ✱ Hendrick H Quality Steel comes from Hendrick's wide experience in selecting and specifying the best analysis of steel for the aggregates industry
- ✱ Hendrick H Quality Perforated Plate is available in high carbon steel, heat-treated after perforating for longer life
- ✱ Product uniformity is assured by uniformity of mesh throughout life of the screen

- ✱ Full clearance of Hendrick H Quality Plate practically eliminates blinding
- ✱ Faster deck changes . . . lower labor cost
- ✱ Large open area assures maximum protection

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"finest loader on rubber..."

"It's the fastest machine we ever had on the job or have seen on any other job," says R. H. Parsons, President of Aggregate Limestone Co., producers of limestone products near Birmingham, Alabama. "We like its capacity, especially the full roll-back bucket action that means more production, cleaner material and cleaner work area. I consider my HO 'PAYLOADER' the finest loader on rubber."

No one knows better than a man with Mr. Parsons' years of experience how to judge the performance of tractor-shovels. His plant produces 8 sizes of stone for use in general construction, road building, concrete, asphalt mix, and fluxing stone for steel processing. Better than 90% of this production is stockpiled and loaded out by HO "PAYLOADER" units.

You, too, will find that among rubber-tired tractor-shovels, none can match the versatility, mobility and productive capacity of the three new 4-wheel-drive "PAYLOADER" units. More reliable traction, greater digging power and faster, easier operation are some of the "PAYLOADER" advantages that appeal to operators who know tractor-shovels best. There are more "PAYLOADER" units in use today than all other models combined and your "PAYLOADER" Distributor wants to demonstrate the "finest loader on rubber" on your work. Why not call him today?



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YOU GET MORE FROM A "PAYLOADER" BECAUSE:

MORE SPEED...

power-shift transmission makes all shifts under full engine speed... no stopping, no clutching.

MORE TRACTION...

exclusive power-transfer differentials automatically deliver more power to wheels with best footing.

MORE DIGGING POWER...

40° roll-back of bucket at ground level and tremendous pry-out action get heaped loads quickly and easily.

LESS SPILLAGE...

hydraulic load-shock-absorber smooths the ride, permits faster load carrying speeds.

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Send data on 4-wheel-drive "PAYLOADER" tractor-shovels as checked:

- ☐ HO (1 to 4 cu. yd. buckets)
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B4



AMSCO PUMP APPLICATION FILE

at: HOLLIDAY SAND & GRAVEL CO.
EDWARDSVILLE, KANSAS

"The big reason for our preference for AMSCO® equipment is the tremendous savings in down time..."



"We're well pleased since changing to Amsco," reports William D. Grimstead, plant superintendent at Holliday Sand & Gravel Co. "With our Amsco Pump, it takes us only four hours to change the impeller. With our previous equipment, it would take anywhere from a day to a day and a half."

Holliday uses a 10" heavy-duty Amsco Pump with Amsco pipeline fittings, including valves and elbows. The pipeline is 750 ft. long with an 87-ft. lift. The Swintek ladder on the dredge picks up a mixture of 90% sand and 10% gravel... loading 210 tons per average hour. According to Mr. Grimstead, they get an estimated 1700 hours of shell life during normal operation, and 800 hours from the impeller.

"I wouldn't think of ever buying anything but Amsco and I would recommend it most highly to anyone in the field," Mr. Grimstead concluded.

QUICK FACTS ABOUT AMSCO PUMPS

Whether your dredging operation is large or small, you can get an Amsco Pump for the job. There are 40 distinct Amsco Dredge Pump models—each type intended for a specific operating range. Standard sizes range from 6" to 20" discharge openings. Larger sizes are also available.

An Amsco Pump engineer will be glad to discuss your requirements. Write for Bulletin No. 1052P which includes specifications and additional information on the Amsco line of pumps.



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self-addressed **READER SERVICE CARD** postage-free

AIR MOVING EQUIPMENT—Joy Manufacturing Co. is offering Bulletin J-611. Described are features of Joy Axivane fans, Series 1000. The vaneaxial fans are available in 136 models.

Enter 718 on Reader Card

BELT REPAIR—Conveyor Belt Service, Inc. describes in a six-page booklet its national service for repairing and rebuilding large conveyor belts. Service to limestone quarries, cement, slag and sand and gravel plants is available with the company's field and shop facilities.

Enter 719 on Reader Card

BLASTING—Spencer Chemical Co. advises explosives users, "Cut Your Blasting Costs with Spencer Puffed Ammonium Nitrate." A leaflet describing uses and advantages is now available.

Enter 720 on Reader Card

CAR PULLER—Jones Machinery Division, Hewitt-Robins, Inc. has published a 32-page bulletin, J-11, showing several installations and describing heavy duty single and double drum car pullers for moving freight cars, barges and industrial transfer cars.

Enter 721 on Reader Card

COMPRESSOR—Ingersoll-Rand Co. has brought out Form 1547 on its recently introduced air compressor, "Channel-Flo." The two-stage, 200 psig. rated motor compressor is presently available in 1½ and 2-hp. sizes.

Enter 722 on Reader Card

CONVEYORS—Hapman Conveyors, Inc., Division of Hapman-Dutton Co., in its new catalog, HC-451, lists application and selection data on its tubular conveyors. These are the sealed-pin chain conveyor, Cableveyor and pivoted-bucket carrier, which is also described in Brochure HB-854.

Enter 723 on Reader Card

CRANE SHOVEL—"Quick-Way" Truck Shovel Co. announces availability of two new bulletins: No. 656 describes the "Quick-Way" crane-shovel Model 85A; No. 756 features Model 105AC crawler-mounted equipment.

Enter 724 on Reader Card

CRAWLER—International Harvester Co. has made available Folder CR-565-G, featuring the TD-24 crawler tractor. The 200-hp. unit is largest in the IH crawler line.

Enter 725 on Reader Card

FEEDERS—Simplicity Engineering Co. has released Catalog 571 on the entire line of Simplicity vibrating pan-type "Os-A-Veyor" and grizzly feeders. Specifications and engineering information on six models in a large number of sizes are provided.

Enter 726 on Reader Card

FUEL SYSTEM—Cummins Engine Co., Inc. has issued a 12-page booklet, No. 950138, which interprets the "Cummins PT Fuel Injection System." Cutaway views show four PT fuel pump assemblies as well as the PT injector.

Enter 727 on Reader Card

GYRATORY CRUSHERS—Traylor Engineering and Manufacturing Co. published Bulletin 1126 on its TC primary gyratory crushers.

The illustrated 41-page booklet contains tables of sizes and approximate capacities of all crushers in the line, with feed openings ranging from 30 to 60 in.; and capacities from 345 to 4,100 tph.

Enter 728 on Reader Card

HARDFACING ELECTRODES—The Sight Feed Generator Co. announces Rexarc Form 2057, a 20-page manual describing Rexarc hardfacing and manganese electrodes.

Enter 729 on Reader Card

HEAVY DUTY FEEDERS—McLanahan & Stone Corp. has made available Bulletin FRE-57 on its reciprocating-plate feeders. The units are designed to feed controlled quantities of materials from sand to shovel-loaded rock.

Enter 730 on Reader Card

HMS PLANTS—Southwestern Engineering Co. describes its factory built, heavy media separation plants for rock products beneficiation in Technical Bulletin E56-1R. Application data are supplemented by a chart on density relations for magnetic suspension media.

Enter 731 on Reader Card

HOSE FITTINGS—The Weatherhead Co., makers of a complete hose and fitting line for pressure hydraulic and pneumatic systems for industrial original equipment and maintenance applications, announces three available bulletins: Form 6071, on its steel tube fittings; Form 6072, hose ends and assemblies; and Form 6073, brass tube fittings.

Enter 732 on Reader Card

INDUSTRIAL DUST CONTROL—Wheelabrator Corp. has available Bulletin 554-D on the subject of dust control in building materials industries. Four illustrated case histories show the Wheelabrator Dustube cloth-filter-type dust collectors in use, and performance data is given.

Enter 733 on Reader Card

INSULATION—Ehret Magnesia Manufacturing Co. has prepared a six-page bulletin, "New Ehret Thermasil" covering its line of calcium silicate insulations for temperatures up to 1,200 deg. F. It recommends the product for furnaces, ovens, boilers, evaporators, heat exchangers, kilns, turbines and breechings.

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FREE INFORMATION

You can obtain catalogs and literature listed on these and other pages of the magazine by entering the number appearing either below or beside the item of interest on the READER-SERVICE CARD in this page.

JACKS—Templeton, Kenly & Co. in Bulletin Industrial 57, lists specifications and ordering data for its Simplex line of mechanical and hydraulic jacks.

Enter 735 on Reader Card

LABORATORY SAFETY—Fisher Scientific Co. has brought out a new pocket-sized edition of the Fisher Manual of Laboratory Safety which covers accident prevention, first aid, fire prevention and safety equipment. A safety bibliography and section on handling radioactive materials are included.

Enter 736 on Reader Card

LUBRICATING SYSTEM—The Farval Corp. has issued Bulletin 70, an eight-page brochure discussing its Lubral circulating oil system for application on presses and semi-automatic or automatic machine tools etc., with built in return oil arrangements.

Enter 737 on Reader Card

METERS—Rockwell manufacturing Co., Meter and Valve Division, has issued a revised condensed 28 page catalog, C-5000, Rev. 8,

covering its meters, regulators and valves. New inclusions are Rockwell telapilot and the Hypregun.

Enter 738 on Reader Card

MILL, PLANT EQUIPMENT—Denver Equipment Co. has published 20-page Bulletin G3 B59, showing improved models in crushing, grinding, screening, classifying, portable and materials-handling machinery.

Enter 739 on Reader Card

MOTOR MAINTENANCE—Allis-Chalmers Mfg. Co. repeats in Bulletins 51X8581 and 51X8582 material taken from two slide films, "How to Make a Motor Go. . . and Go, and Go, and Go," and "How to Take Step Seven." Both use cartoon technique to depict proper motor maintenance.

Enter 740 on Reader Card

MOTORS—Electra Motors Inc. has brought out Bulletin 60-2, cataloging the expanded line of parallel-shaft Electra-Gearmotors in both built-in and motor-coupled types.

Enter 741 on Reader Card

PUMPS AND MOTORS—Kalamazoo Division, The New York Air Brake Co., lists as available new literature Service Manual S-1010 for its flange and foot mounted pumps and fluid motors; Bulletin 400 on its fluid power equipment—pumps, motors, control valves and cylinders—for earth moving and materials handling equipment and other mobile applications; and Bulletin 142A, describing the Series H Hydrex Pumps.

Enter 742 on Reader Card

REFRACTORY MATERIALS—Pibrico Co. has released a new catalog on its refractory products for calcining, drying and processing furnaces. Advantages of the monolithic construction are explained, and usefulness of the equipment to the cement, phosphate and gypsum industries is related in text and photographs.

Enter 743 on Reader Card

REGULATOR—Hauck Manufacturing Co. has released Catalog Sheet 722-A describing the "RRO" oil-air ratio regulator for low pressure burners. The unit is designed to deliver the proper oil pressure to correspond to the air pressure going through the burners.

Enter 744 on Reader Card

SCRAPER—International Harvester Co., Construction Equipment Division, announces Booklet CR-525-G, containing descriptive material on its 14-cu. yd. Model 55 Psycraper.

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SEPARATORS—Carpco Manufacturing, Inc. is offering three new bulletins. HTB-103 discusses high tension separators, listing minerals which can be separated and describing both laboratory and industrial models. HPB-103 covers laboratory model HP-167. Bulletin MIB-103 is concerned with design and applications of high intensity induced roll magnetic separators.

Enter 746 on Reader Card

STORAGE BINS—The Neff & Fry Co. features its "Super-Concrete Stave" storage bins for industry in a new four-page bulletin. Design features are incorporated, as well as tables of capacities and lists of users.

Enter 747 on Reader Card

TRACTOR EQUIPMENT—Sherman Products, Inc. is issuing three new bulletins on its equipment designed for use with Fordson tractors. Sherman front end loader, Models AJ-20 and AJ-25, and Sherman Major power digger, Model 54E, are described in Bulletins SP-47OR 25 and SP-554-40M respectively. Form No. SP-675-40 is devoted to Sherman power digger Model 54F.

Enter 748 on Reader Card

TRAILER SUSPENSION—A. O. Smith Corp. gives complete details on its new integral-axle "5th wheel" tandem trailer suspension in Bulletin MO-100. Simplicity of design and installation are depicted in detailed drawings.

Enter 749 on Reader Card

WEATHER-PROTECTED MOTORS—Allis-Chalmers Manufacturing Co. is making available Bulletin 51B8606A. Weather-protected motors, Type FOD, in ratings from 250 to 900 hp, are described.

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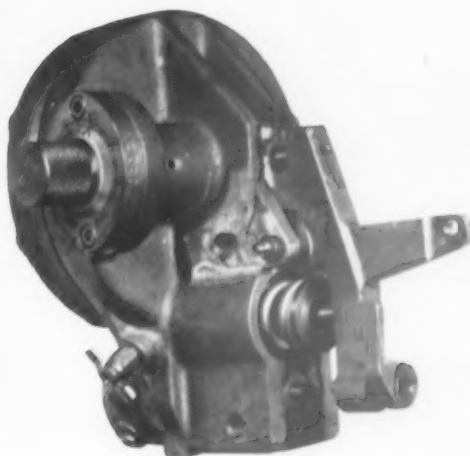
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SERVAIR DEMAND CONTROL



ONLY JOY AIRVANE PORTABLE COMPRESSORS HAVE THIS NEW FOOL-PROOF LOAD CONTROL

The new Servair Demand Control takes the mystery out of pressure setting . . . makes it as simple as turning up the furnace thermostat at home. You just set the dial for the pressure you need and the Joy Airvane Rotary will deliver it.

The Servair is a true "demand" load control because it matches compressor output to demand . . . from 0% to 100% capacity. The control maintains steady air pressure regardless of the number and size of tools cutting in and out during operation, yet runs the engine only fast enough to meet the demand for air. This gives you top fuel economy and a minimum of wear and tear on the engine and compressor.

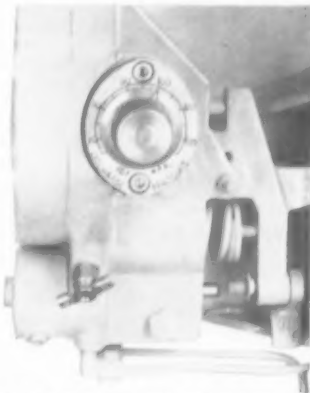
Joy Airvane Rotaries have many other features that make them trouble-free:

THERMAL BY-PASS—an exclusive oil circulating system that provides immediate lubrication and temperature control under all weather conditions.

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ROCK PRODUCTS, July, 1957

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Officers of the association: Vincent P. Ahearn, Executive secretary; Ken Tobin, Associate Executive secretary; William J. Woods, Jr., new board member; Arthur B. Schlesinger, treasurer. Emery M. Durstine, association president, and William J. Cannon, vice president, were not available when the picture was taken

Zoning highlighted at Industrial Sand meeting

Other highlights centered around: the economic activity (it's on a gentle climb—for the short pull); progress in community planning; the railroad car situation (it looks good—until the Fall) and taxes (there's quite a bit of activity—watch 1958)

THE ZONING PROBLEM promises to be the largest single problem that the natural resources industries will face in the future. It is imperative that industrial sand producers begin now to formulate a long-range positive program to promote good will of his community. This was a major message brought to the 22nd annual meeting of the National Industrial Sand Association at Hot Springs, Va., May 14-17.

About 90 members and their wives, plus N.I.S.A. staff members and guests, met to hear talks on additional subjects including taxes, national economy, railroad car supply and community planning. The usual committee reports brought the membership up to date on present and planned activity.

Emery M. Durstine, of The Keener Sand & Clay Co., Columbus, Ohio, was re-elected to serve as N.I.S.A. president for another term. Other officers also re-elected were: William J. Cannon, vice president and Arthur B. Schlesinger, treasurer. Three new members were elected to the 12-member Board of Directors: Thomas H.

Hardy of the Hardy Sand Company, Clarence H. Woods of Wedron Silica Company, and William J. Woods, Jr. of Pennsylvania Glass Sand Corp. These members replaced Earle T. Andrews, R. J. Croneweth and Alfred Gawthrop, each of whom has served the association long and well.

Car availability up. N.I.S.A. President Durstine, presiding over the opening session, introduced Caleb R. Megee, vice chairman, Car Service Division, Association of American Railroads. According to Mr. Megee, the equipment picture looks good for sand producers in the future. It's better now than it was a year ago, for 23,000 new freight cars were brought into service the first three months this year. Mr. Megee estimated that there would be added a net figure of 50,000 cars this calendar year. He gave the group more figures than could be copied conveniently to substantiate his feeling that the car situation is getting better all the time. It had to, he indicated, since the expanding economy is creating a

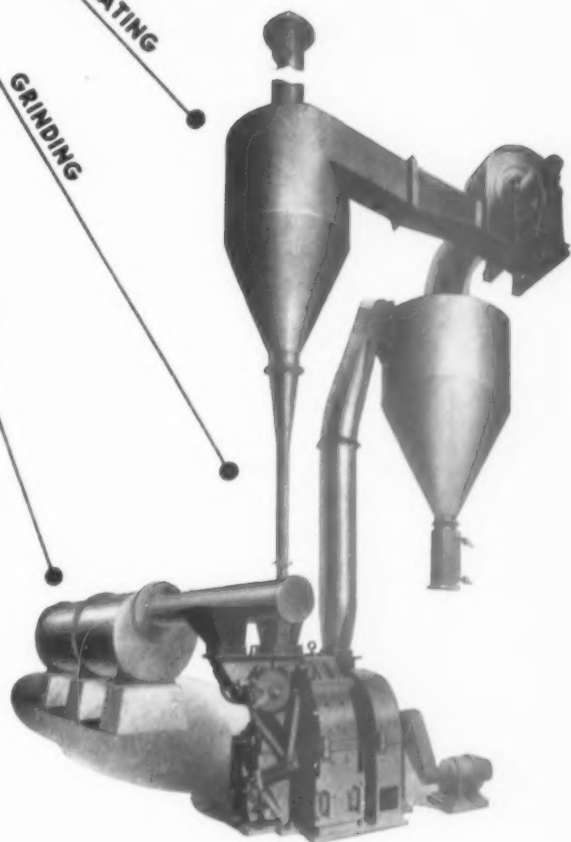
need for more usable railroad cars. But—there may be a tightening in hoppers east of the Mississippi until next November, and the gondola situation will be tight this year.

The tax picture. John T. Sapienza, tax counsel for the association, gave a comprehensive review of the tax situation at the opening session. Much of his report was encouraging. He covered the subject from three sides—legislative, judicial and administrative. There has been lots of activity in the legislature on taxes, but so far little has been actually done. It's highly possible that, if individual tax relief does come, it will not be before the first of next year. As to depletion, it is believed that the drive this year has lost steam. The trend is toward an overall examination of rates, and it will be wise to watch developments next year. It is only an opinion that transportation taxes may be reduced gradually over the next three to four years, then eliminated entirely.

(Continued on page 134)

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Ewan Clague, Commissioner of Labor Statistics, Bureau of Labor Statistics, United States Department of Labor, spoke on the economic outlook for 1957.



Henry M. Wick, Jr., Traffic counsel for NISA spoke on "The Industrial Sand Case in Ex Parte 206."

INDUSTRIAL SAND MEETING

(Continued from page 132)

One of the most interesting possibilities reported was that thought is being given to percentage depletion on human resources. This may be in the form of an income tax reduction based on age. For example: a man is 45 years of age, and it is assumed that he has depleted some of his human resources. The tax reduction may be figured by multiplying one percent times his age—but no tax would exceed 27 percent.

As to the judicial activity, Mr. Sapienza indicated that the Treasury Department is continuing its crusade against the brick and tile industry on the cut-off point. It has battled zero in nine cases to date, since the decisions have indicated that the commercially finished product is the cut-off point. But Treasury continues to fight.

The American Gilsonite Co. case is significant to those who pulverize or dry their products, which would include industrial sand producers. According to Mr. Sapienza, producers can refer to this case as authority as far as percentage depletion is concerned. In this case, the company pulverized 10 percent of its crushed product, put it into trucks and hauled it 113 miles where it was sacked and shipped to customers. The court held that depreciation allowance should be allowed on the cost of pulverizing, but not on cost of sacking. This differs from previous coal cases on the same subject. It was learned during the

meeting that the Circuit Court had overruled former courts in the Oregon cement case. The ruling was favorable to the cement company and extended the percentage depletion rate to the finished product.

The big development in administration activity on taxes was the Treasury's issuance of proposed regulations on natural resources. The industrial sand group has been particularly active on this. Mr. Sapienza indicated that there have been so many protests to these proposed regulations that Treasury may issue another set.

What about business? The second official session on Thursday morning heard that business activity would continue upward for the short pull, but it is obvious an economic downturn can be expected eventually. A complete run-down on traffic and transportation developments was given by William J. Woods, Jr., chairman of N.I.S.A. Traffic Committee. He covered railroad car supply, the federal transportation tax, and the rail carriers' petition for higher freight rates under Ex Parte 206. A full report on the latter was given by Henry M. Wick, Jr., Traffic Counsel for the Association. William J. Cannon, N.I.S.A. vice president, presided at the session.

Ewan Clague, Commissioner of Labor Statistics, Bureau of Labor Statistics, Department of Labor, used charts to illustrate that varied pictures of business activity in several categories may be obtained. The method is

used sometimes by economists to show a desired comparison of statistics, and Mr. Clague illustrated the method.

Mr. Clague continued his interesting chart-talk, covering such basic items as crude materials, food prices, retailers and the consumer price index. As a final analysis, he indicated that factors making for increased business are in the majority for the rest of this year. Prices will creep upward for the short-range period, but he thinks it obvious that they cannot rise forever. We can expect another downturn—sometime—similar to those experienced in 1949 and 1954. But—using former Secretary Humphrey's famous phrase—it will be nothing to "curl your hair."

Confused freight rates. A complete detailed report of post-war freight-rate increases was presented by Henry M. Wick, Jr., who is the able traffic counsel for N.I.S.A. This probably is the most comprehensive report on the subject that has been given. Mr. Wick began back in April 1946 with Ex Parte 162 and brought the history up to date to Ex Parte 206—the sixth post-war general increase case—which began last year. In the 10-year period, railroads have been granted cumulative percentage increases totaling 118 percent. These raises, explained Mr. Wick, were granted by I.C.C. on the basis of arguments of increased costs. Rail rates on industrial sand increased substantially during the period, but sand prices rose only 55 percent.

In Ex Parte 206, railroads changed their tune in asking the Commission for an increase of 15 percent. They asked for more income to assure that their rate of return be substantially improved. Two months later (November, 1956) they came forth with a new emergency petition asking another increase of seven percent to meet in-

(Continued on page 136)

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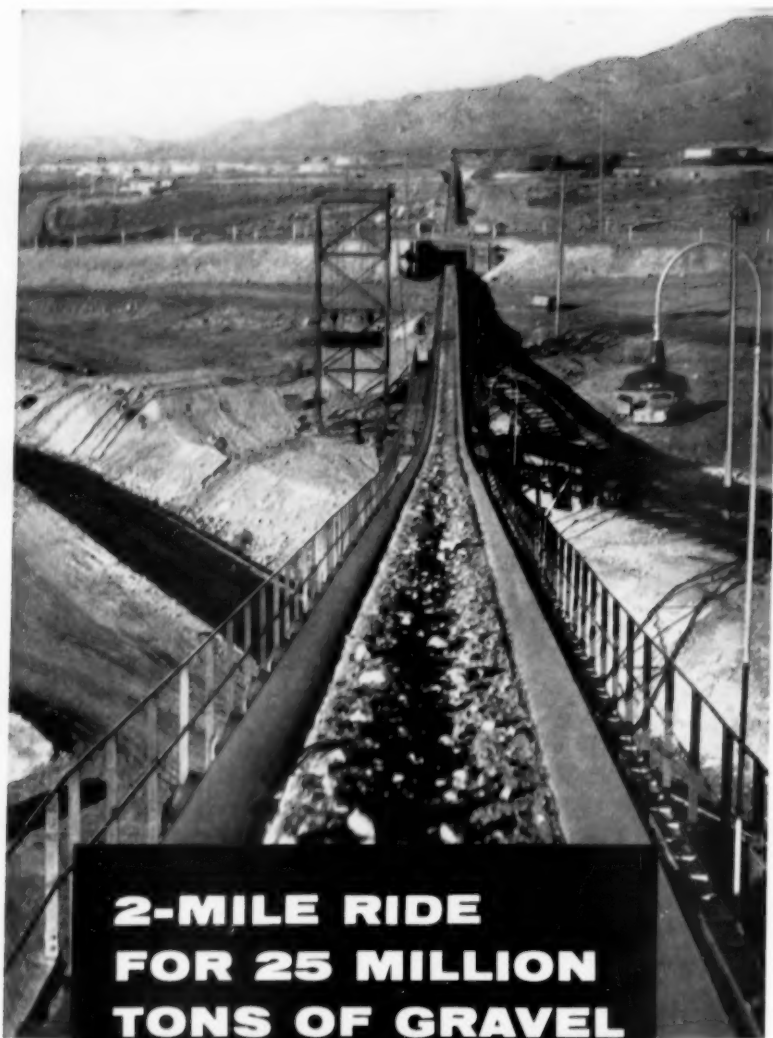
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INDUSTRIAL SAND MEETING

(Continued from page 134)

creased costs. The roads got their emergency raise in December of 1956, including southern railroads that had not asked for the 15 percent raise. Eastern roads got seven percent, western and southern roads five percent. Rock products were held to an increase of three percent in the south.

Further complication was added when east-west carriers consolidated their original proposal and asked for a 22 percent jump, including the seven percent they already had been allowed. Southern railroads followed, generally, and asked for 15 percent, including five percent they already had. Then, the I.C.C. put both cases together to hear them at one time. That argument was concluded in Washington on June 3.

Mr. Wick could not predict what would happen to the case, nor to industrial sand rates. But he did expect some increase for the roads—maybe 7-8 percent. Final orders are expected in July or August.

Community planning. From an interest standpoint, the third and final session of the meeting held the spotlight. Three subjects that are of great importance to industrial sand producers were discussed: community planning, zoning problems and Mr. Ahearn's Washington report.

Community planning, as it affects the industrial sand industry, was discussed by Sterling N. Farmer, Sand Products Corp., Cleveland, Ohio. He stated that the industrial sand industry must concern itself with the subject, since population growth is mainly in "urban" areas where sand plants are located. He urged that each producer take every opportunity to tell government officials at all levels (they're concerned about the population increase) that sand products are necessary to the economy of the nation and to the local community as well. He reported on a series of meetings on the subject held in Cleveland, Ohio, with expert community planners representing various cities in Ohio and utility companies.

Zoning—big problem. Zoning problems, according to Kenneth E. Tobin, Jr., N.I.S.A. associate executive secretary, are of first importance to the minerals producer. The producer's personal attitude may be the key to the zoning question, he said, since it is up to him to be active in the formulation of the zoning ordinance from the start.

First, he should know and under-

(Continued on page 138)



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INDUSTRIAL SAND MEETING

(Continued from page 136)

stand the nature and theory of zoning law. He should be most familiar with provisions or proposed changes of the law, and the motivating reasons. The main thing to remember is the purpose of zoning: to have a planned development of the community, reserving the land for its highest and most beneficial use, to promote the public health, welfare and morals. He went on to say that reservation of valuable mineral deposits for their development by a competent industrial producer is inherent in that theory. Thus, a zoning ordinance that classifies a deposit for some other purpose is contradictory of basic reasons behind zoning law.

After presenting a most thorough background and history of zoning law, Mr. Tobin explained the various sections that usually are contained in such laws. These are four: general provisions, zoning boundaries, zoning regulations, procedure for amendment.

He explained that two basic concerns of the industrial sand producer with the legal aspect of zoning are the pre-existing nonconforming use, and performance standards. Dangers of a zoning ordinance that does not allow the continuance of the former include the fact that a valuable deposit may be lost forever, or that a business may have to fold. Performance standards are the chief concern of the industrial sand producer. Rehabilitation of land, limitations on noise, hours of operation, dust, access of trucks, tree planting, fencing—these and others may be controlled in a zoning ordinance.

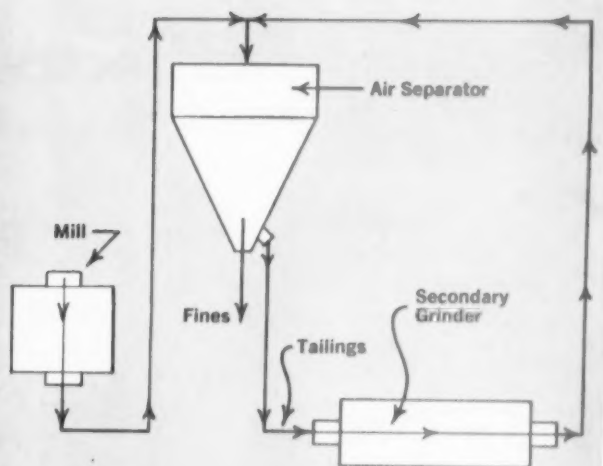
Mr. Tobin urged strongly that this major problem be met with a positive program designed to promote greater understanding and good will between the producer and his community. Now is the time to begin that program.

Interest in the zoning problem was high at the meeting, and resulted in several comments from the floor on current problems of the various producers. These comments only proved the value of Mr. Tobin's presentation, which was based on a lot of intense research. It was suggested that the industrial sand industry become more active in the question and get help from some of the valuable work on zoning and public relations that has been done by kindred industries.

The meeting ended with the usual highlight of Mr. Ahearn's review of the Washington picture.

END

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ROCKY'S NOTES

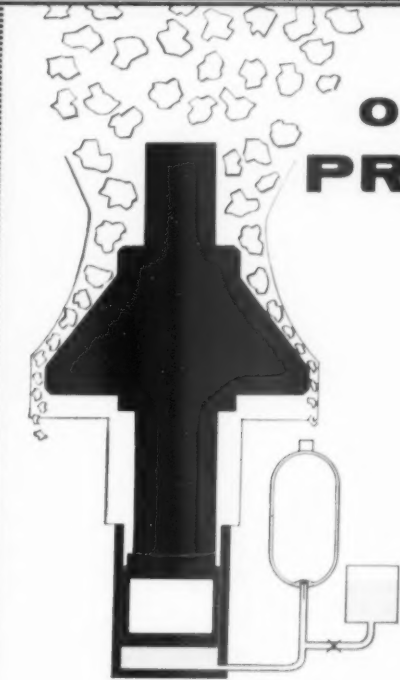
(Continued from page 19)

brought into intimate contact, the surface energy of one tends to neutralize the surface energy of the other, and the chemical reaction, the formation of calcium silicate, results.

While the crystal structure of silica is not destroyed by high heat, that structure is distorted (from quartz to tridymite, cristobalite and fused quartz). Since in such distortion there is a lowering of the specific gravity, or of the density of the particle, it is assumed that the very strong bonds between the silicon and oxygen atoms are stretched and much weakened, and in this state (in the high heat of the kiln) the particles of lime begin to penetrate the lattice of the silica particles and thus in time convert the whole of the silica particle to calcium silicate. However, in portland cement manufacture the proportion of lime used is in excess of that required for a stable product, and the lime-silica reaction introduces more oxygen atoms (or ions) into the silicate lattice structure than that structure can neutralize or utilize. Some of these oxygen atoms (or ions) therefore must still be combined only with the calcium as CaO. This is not "free lime" in the sense that the term is used in portland cement literature, because it is enclosed or enmeshed in the silica crystalline framework, or lattice. When water is added to the pulverized clinker or cement this embedded lime is among the first particles to hydrate, and it probably hydrates, like any active high calcium lime, with explosive force. This helps destroy the silica or silicate lattice and makes its hydration faster and more complete. That is why, probably, the higher limed cements are faster acting, though not necessarily most durable or strongest.

Some idea of the break up of the silica or silicate lattice by the action of the water on lime (or the clinker particles containing the lime) can be gained if, as is believed, the size of the colloids formed is estimated to be about 100 Angstrom units in diameter. Thus, an average particle of clinker of 400,000 Angstrom units diameter is reduced to colloid particles of hydrated calcium silicate 100 Angstrom units in diameter. Since the volumes of spheres vary as the cubes of the diameters this is a reduction of $400,000^3$ to 100^3 , or something like 64,000,000,000,000,000 to 1,000,000 (or 64,000,000,000 to 1). Either way the actual figures are about in terms of our national debt—and incomprehensible.

(Continued on page 142)



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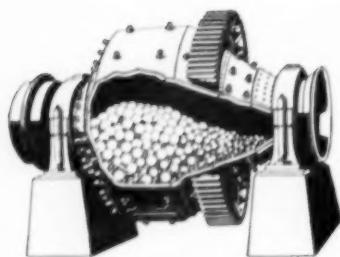
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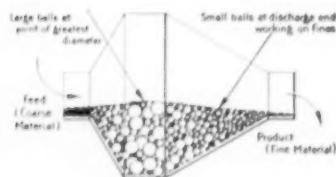
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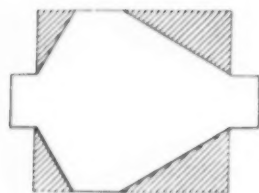
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No dead corners . . .

The principle of the Conical Mill is sound. Note that the longitudinal cross section forms a truss. Strength is obtained without massive construction. Excessive dead weight, extra power and high operation costs are eliminated.

Bulletin 17 C 7, dry grinding; Bulletin AH 389-7, wet grinding.



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ROCKY'S NOTES

(Continued from page 110)

Sizes of atoms and molecules. A colloid size of 100 Angstrom units probably is beyond our comprehension since 40 microns or 400,000 Angstrom units is the limit of vision with the naked eye, and 1,000 Angstrom units the limit of an optical microscope. The average sizes of mineral atoms and molecules are in the neighborhood of perhaps about 10 Angstrom units. Thus, if the smallest particle of hydrated cement has a diameter of 50 Angstrom units, as is believed, the relative sizes of atoms and molecules in the colloid is $10^3 : 50^3$ or $1,000 : 125,000$ or as 1:125. In other words, we are a long way from having reduced the particles composing hydrated portland cement to atomic or molecular size. Of course, we don't know what is inside the colloid particle other than silica or calcium silicate gel and a kernel of unhydrated clinker. The gel is supposed to hold both "combined water," and more or less "free" water, and to be of loosely crystallized particles.

The hydration of a particle of clinker is again a surface reaction between solids. The minerals involved need not be in a state of complete solution. There is never enough water present to accomplish that. Moreover, the conditions are not favorable. Lime, in this case calcium hydroxide $[\text{Ca}(\text{OH})_2]$, is practically insoluble in hot water, and silica or silicates are very little soluble in cold water, but much better so in water near the boiling point. Moreover, with either substance saturation of the solution would be a slow process. Hence, the old theory of ordinary chemistry that lime and silica were simultaneously completely dissolved and reprecipitated as hydrated calcium silicate does appear logical. A more acceptable theory, based on recent research on calcium silicates as such, would seem to be that the calcium hydroxide makes a surface reaction with colloidal silica particles, and works inward by breaking into the silica or silicate lattice. Given time and proper conditions, the entire particle could become what is called an hydrated calcium silicate, but the ratio of lime to silica may be anything from a fraction to 2, depending chiefly on the pH value, or basicity of the water medium. The mystery of just what a hydrated particle of cement actually is, remains. But the probability is that it owes its cementing properties to the ability of silica or silicate gel to reject surplus water and recrystallize in chains, sheets (or plates) and three-dimensional frameworks or lattices of

silica tetrahedrons. The calcium mineral that is left may be simply CaO or $\text{Ca}(\text{OH})_2$ particles enmeshed in this lattice, which would make it a "solid solution" similar to the structure of many similar minerals, where the exact nature of the bonding is unknown. Since all this lime may be dissolved out and only the silica lattice left this would appear to be the most logical conclusion. Also, we know that silica gel recrystallized in this manner is one of the best mineral cements in Nature's rocks. The lime is helpful in bringing about the colloidal condition of the silica but may not be essential in the final result.

END

Schedules papers for National Safety Congress

THE EXECUTIVE COMMITTEE of the Cement, Quarry & Mineral Aggregates Section of National Safety Council, meeting May 20 in Cleveland, Ohio, anticipated the National Safety Congress to be held in Chicago, Ill., October 22-23, 1957.

Program chairman William Kipp of Universal Atlas Cement Co. announced that the following papers will be presented: "Job Interview Program of Universal Atlas Cement Co.," "Fatalities in the C., Q., and M. A. Industries," "Safer Blasting through Engineering," "Safety Disciplines," "Personal Protective Equipment Program of Ideal Cement Co.," and "Conveyor Safety."

The executive committee, with Howard Riefenstahl of Alpha Portland Cement Co. presiding, decided to inaugurate a safety campaign in 1958 for 100 percent locking out of machinery switches, bin gates, etc. Later campaigns will involve personal protection and protective devices.

Supplement published to rock blasting manual

THE FOURTH SUPPLEMENT to "Manual on Rock Blasting" has been announced by Atlas Copco. Available at a production cost of \$3 a copy, the supplement includes articles on "Sub-level Caving in Swedish Mines," by J. Hedlund and B. K. Lundin, "The Effects of Blasting on Nearby Structures," by Fred E. Cornwell and "Compressed Air Lines for Mines and Construction Sites," by C. J. Tallberg.

Copies of the new supplement and complete manual are available both from Atlas Copco Eastern, Inc. of Paterson, N.J., and Atlas Copco Pacific, Inc., San Carlos, Calif.

WATCH FOR FIRESTONE WHEN BIG JOBS BEGIN TO MOVE!



Firestone Rock Grips lead all tire choices with tread designs that travel any terrain!

Firestone Tubeless Rock Grips are making big news wherever heavy equipment rolls. Two great tread designs match toughness with traction to move your heavyweights over any course. Rock Grip construction eliminates your need to change tires to match terrain. It delivers the full flotation you need for sand and soft stuff. It also has the armored grip necessary to negotiate rock-hard runs over broken shale. Safety-Tensioned *Gum-Dipped*® nylon bodies and cut-resistant treads make these Firestones first choice tires with men who move equipment. Your Firestone Sales Engineer can demonstrate why you'll make them your first choice, too. Contact him today—through your local Firestone Dealer or Store.

Firestone
BETTER RUBBER FROM START TO FINISH

Copyright 1957, The Firestone
Tire & Rubber Company



ROCK GRIP WIDE BASE

ROCK GRIP

Enter 1570 on Reader Card

ROCK PRODUCTS, July, 1957

NEW U.S. PATENTS

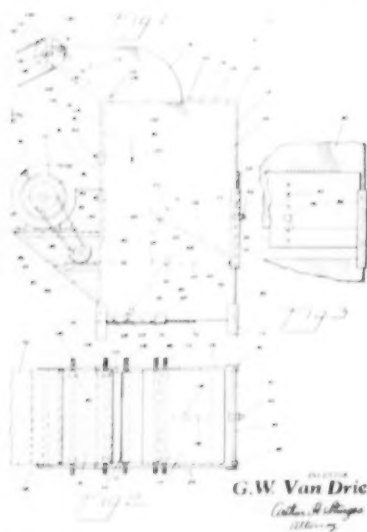
OLIVER S. NORTH

Recently issued patents on nonmetallic minerals*

Aggregates

2,791,331—A gravel cleaning machine wherein the gravel drops by gravity through a blast of air. The impurities having a lower specific gravity than the gravel particles are deflected and removed. The apparatus can be adjusted to handle almost any mixture of gravel and impurities. (to G. W. Van Drie.)

Figure 1, below, is a side view, with baffles and adjusting plates shown in dotted lines. Gravel mixed with im-



purities is fed by belt conveyor 20 to feed hopper 14, and thence into the apparatus. The material drops by gravity along the approximate path shown by arrow 132, and is intercepted by a controlled blast of air from blower 22. Since most of the impurities have a lower specific gravity than the gravel particles, they are deflected onto baffle 26 and removed to waste. The clean gravel drops on down to baffle 28, which directs it to a discharge opening. By careful adjustment of the baffles and variation in strength of

the air blast, a satisfactory aggregate can be produced from virtually any mixture of gravel with shale, clay, coal, concretions, sticks or the like.

2,791,383—A device for co-ordinating the hydraulic raising and lowering of the outer crushing member or concave of a gyratory crusher used for producing crushed stone, and for automatically stopping the drive motor when tramp iron or other foreign material enters the apparatus. (to A. W. Kjelgaard.)

Gypsum

2,788,201 — An improved mining and loading machine adapted to the working of low seams of coal, salt, gypsum and other flat-bedded mineral deposits. (to F. A. Lindgren and R. C. Lundquist. Assigned to Goodman Mfg. Co.)

2,788,269—In an improved process for preparing ammonium sulfate for use in fertilizer compositions, gypsum is mixed with ammonium carbonate or bicarbonate and the mixture is heated in a closed vessel to the dissociation temperature of the ammonium compound. The reaction products then are dried at room temperature, producing a fine white powder of ammonium sulfate. (to A. L. Burwell. Assigned to University of Oklahoma Research Institute.)

2,791,511—Alpha gypsum is used as the base material in the preparation of an improved waterproof material suitable for surfacing floors, roads and other surfaces that are subjected to considerable wear. (to H. Lipkind, A. I. Sherer and M. H. Zara. Assigned to L. Sonneborn Sons, Inc.)

Phosphate Rock

2,786,746—A method for expediting and increasing the formation of soluble phosphates during the manufacture of superphosphate by acidulation of phosphate rock. A nonhygroscopic, water-soluble alkali metal salt of a sulfonated naphthalene is added to the ground ore prior to treating it with sulfuric acid. (to A. Goldhaar. Assigned: Universal Detergents, Inc.)

2,789,045 — The process for con-

verting phosphate rock to superphosphate is improved by addition to the rock-acid slurry of a product produced by condensing ethylene oxide with an amino substituted amide. The operation is rapid, and the superphosphate product resists caking during the curing interval and later in storage. (to G. G. Stier and G. D. Conover. Assigned to Nopco Chemical Co.)

2,790,702—In a process for recovering phosphate and uranium values from phosphate rock, sulfuric acid is added to the pulverized ore and the resulting slurry treated with chlorine gas. Following leaching, the unreacted material is filtered off and subjected to a strong solubilizing acid to render the uranium values more soluble. (to R. F. McCullough. Assigned to United States Atomic Energy Commission.)

2,790,705—A process for recovering fluorine and fluorides from waste gases evolved during manufacture of superphosphates, phosphoric acid and other products from phosphate rock. Boric acid or a boric acid compound is used as a scrubbing solution. (to R. H. Kean, E. W. Taylor and J. W. Venable. Assigned to Virginia-Carolina Chemical Corp.)

Cement

2,788,280—Granular, particulate or powdered materials, including portland cement, powdered mica and gypsum plaster, can be made water-repellent and substantially noncaking in storage by treatment with silicon chloroform vapor or similar substance. (to J. B. Rust and L. Spialter. One-half each assigned to Montclair Research Corp., and Ellis-Foster Co.)

2,790,724—A dry powder oil well cement having retarded set comprises portland cement and a small percentage of an agent selected from the group consisting of polyalkenesuccinic anhydrides and related compounds, and their derivative acids, salts, amides, etc. (to W. E. Bergman. Assigned to Phillips Petroleum Co.)

2,790,725—In the wet process manufacture of portland cement, the raw slurry can be made less viscous and hence more readily pumpable by add-

(Continued on page 146)

*Copies of United States patents are available at a cost of 25 cents each from The Commissioner of Patents, Washington 25, D.C. For convenience, coupons, each good for one copy of any patent, may be purchased from that official at the rate of \$5.00 per 20-coupon pad or \$25.00 per 100-coupon pad.

the **BIG 3** puts the 2½-yd. LORAIN-85A years ahead!

These 3 big features will mean more to you in profits than anything you can find in any other 2½-yd. shovel-crane. They mean greater operating ease, longer life, increased crane capacities and reduced maintenance. Of course, there are many more features in the Lorain-85A . . . torque converter power-take-off, new "operator designed" cab, full air controls of all crawler operations, removable counterweight, are but a few. The Lorain-85A is years ahead in the important features that will put you 'way ahead in profits.

Be sure you know all about the "85A" . . . your Thew-Lorain Distributor will explain every detail!

ST. CHARLES QUARRY of St. Charles, Missouri, puts the big power of a 2½ yd. Lorain-85A Shovel on tough rock digging. Note the operator at the 2-lever, "Joy-Stick" air controls . . . the simplest, easiest, most effortless operator controls on any shovel-crane. Production gets a boost—and the operator gets a break with the new Lorain-85A.

THE W LORAIN®



"SHEAR-BALL"™ TURNTABLE MOUNTING



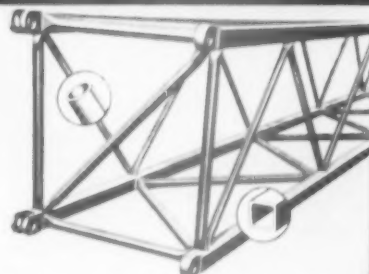
Turntable is secured to crawler and revolves easily and freely on a huge "ball bearing." No center pin or nut, centering gudgeon or exposed roller path . . . no turntable rollers . . . no constant adjustment, maintenance or lubrication problems.

2-LEVER, "JOY-STICK" AIR CONTROL



The newest of all shovel-crane power controls. "Metered Air" feeds power to clutches at any rate desired — yet operator retains full "feel" of all operations. Fewer levers, fewer motions, faster, smoother, less effort, less fatigue.

SQUARE-TUBULAR-CHORD* BOOM



Reduces boom weight and increases lifting capacities. 40 to 48-ton crane capacities on general-purpose crawler . . . 50 to 60-ton on larger, wider crawler . . . up to 200 ft. boom, plus 40 ft. extension available.

THE THEW SHOVEL CO., Lorain, Ohio

*U.S. and foreign
patents applied for.

NEW U. S. PATENTS

(Continued from page 144)

ing thereto enough carbon dioxide gas to lower the pH to between six and seven, thereby producing a slurry having reduced viscosity. (to D. R. Williams. Assigned to Monolith Portland Midwest Co.)

2,792,312—The filterability of a slurry of **portland cement** raw materials can be improved by adding to the slurry a quantity of an alkaline earth metal halide sufficient to increase the filtration rate but not in excess of two percent of the weight of the solid components in the slurry. Among the compounds thus usable are calcium chloride, magnesium chloride, calcium nitrate, calcium bromide and magnesium bromide. (to E. W. Geary and E. C. Kreager. Assigned to Pittsburgh Plate Glass Co.)

2,792,924—Design for a new mechanism suitable for air cooling of sintered materials, such as **hydraulic cement**, burnt **lime** and the like. The material is spread in successive, relatively thin layers on a partially inclined and partially stepped rotating platform. A large surface area is exposed to the atmosphere for radiation of heat from the bed of material. (to G. W. Vreeland. Assigned to Kaiser Steel Corp.)

Figure 2, below, is a sectional view of the mechanism taken through its center. The apparatus is constructed of a plurality of truss-like frame members 2 and beams 3 and 4. Supporting column 5 is affixed to a shaft 6 rotatably mounted on support 7. The bed on which the material is cooled

consists of refractory-faced inclined surface 31 and steps or aprons 35 and 36. The angle of the inclined surface should be slightly greater than angle of repose of material being cooled.

As the apparatus rotates on wheels 12, hot material is deposited from discharge spout 53 onto the inclined surface 31. The layer of cooling material works its way down to apron 35, where plow member 38 levels it and keeps it moving outwardly and dropping off onto apron 36. As many aprons as needed can be used. When a satisfactory low temperature has been reached, plow member 39 rakes the material onto discharge conveyor 60.

2,793,020—A method and apparatus for supplying a uniform flow of secondary combustion air to kilns used for the heat treatment of various raw materials, particularly the burning of **hydraulic cement**, **limestone**, **magnesite** or **dolomite**. (to B. H. Puerner. Patent assigned to the Allis-Chalmers Manufacturing Co.)

Vermiculite

2,786,471—Filter tips, or filter fills, for cigarettes are made of loosely packed granules of exfoliated **vermiculite**, which will effectively filter tars, nicotine, moisture, dust and the like from the smoke. The vermiculite fill is placed between a long section of tobacco to be smoked and a relatively shorter section to be held in the smoker's lips. (to K. W. Grayheal.)

2,791,496—A method of producing a combination soil conditioning and fertilizing material by impregnating exfoliated **vermiculite** with fertilizing agents. Heated particles of exfoliated

vermiculite are subjected to a fine mist formed by mixing air and a liquid containing the desired fertilizers. (to R. W. Rice.)

Trona

2,792,282—A method for producing very pure, colorless **soda ash** from **trona**. The ore is dissolved, and crystals of sodium sesquicarbonate caused to be precipitated. A small portion of the mother liquor is treated with carbon dioxide to produce crystals of sodium bicarbonate, and then the slurry of mother liquor and sodium bicarbonate crystals is recombined with the main feed stream, to which crude and calcined trona has been added. (to R. D. Pike, K. B. Ray and The Stamford Trust Co., executors for said R. D. Pike, deceased.)

Lime

2,786,012—Process for the manufacture from finely pulverized **limestone** of an improved calcium carbonate product especially useful as a diluent in or carrier for insecticidal dust compositions. A small percentage of a higher fatty acid is added to the pulverized limestone to produce a material that is hydrophobic, fully dispersed, free flowing and noncaking. A substantial amount of **fuller's earth** may be added to the composition. (B. B. McHan. Assigned to Calcium Carbonate Co.)

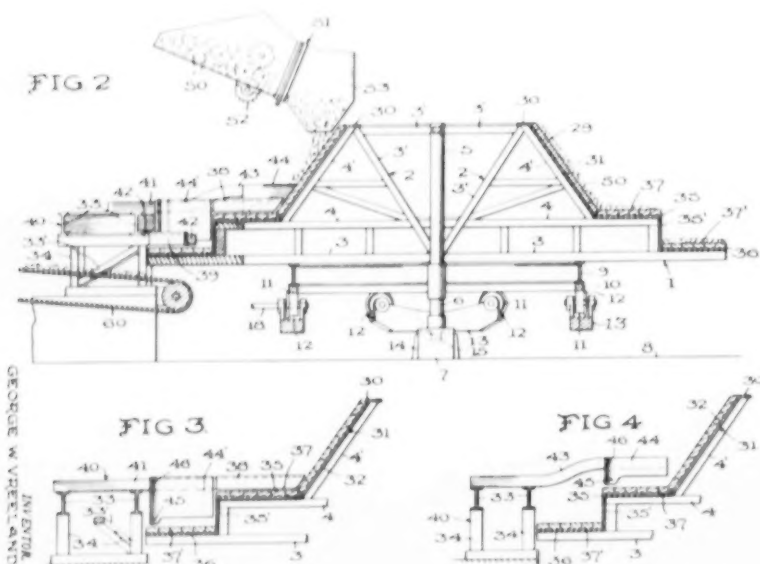
2,786,815 — A composition useful for laying dust in coal mines comprises magnesium hydroxide, calcium chloride, laurylpolyglycol ether and hydrated **lime**. A slurry of the materials is prepared, agitated, and allowed to stand until it reaches a pasty consistency. It is then sprayed on ceilings and coal faces. (to H. Buggisch, J. Muller-Romer and H. Nees. Assigned to Chemische Fabrik Kalk G. m. b. H.)

2,790,550 — A combination pneumatic-centrifugal separator having means for guiding the material to be classified, for example pulverized **limestone** in the 5 to 40 micron range, through several zones of classification. Sharp separation of fine particles can be effected. (to W. T. Doyle and P. Hooper. Assigned to Sturtevant Mill Co.)

Miscellaneous

2,785,987 — Roofing and siding compositions comprise a mixture of about 35 to 50 percent of **slate flour**, 25 to 35 percent of **portland cement** as a binder and 15 to 20 percent of **asbestos fiber**. (C. L. Blake.)

END



In actual road tests . . .



Dodge won top honors in test after test between comparable models of all three low-priced trucks. Special high-speed camera records actual finish of hill-climb test. From a standing start, test crews raced all three trucks up a 32% grade. Dodge was first by five lengths.

and on your job . . .



Dodge gives you more V-8 power, in every weight class, than either of the other two low-priced trucks. From 204-hp. pick-ups to 232-hp. tandems, the extra power you get in a Dodge means an on-the-job performance bonus for you. It means greater economy, too, because it cuts down engine strain, reduces wear and repairs.

Dodge Power Giants outpower, outperform the "other two" low-priced trucks by wide margin!

Want power? Dodge outpowers its low-priced competitors by as much as 27 percent.

Want economical performance? The advanced design of the Dodge short-stroke V-8 produces the most efficient fuel usage in the industry. You get more miles per gallon . . . full power on regular gas.

Want extra payload capacity and handling ease? Dodge has 'em beat on both counts.

How about it? Don't you think you should find out for yourself? Just give your Dodge dealer a ring. He'll bring a truck right to your door and he'll show you certified test results that demonstrate Dodge is a winner in actual tests and on your job.

DODGE
Power Giants

MOST POWER OF THE LOW-PRICED 3

NEW

MACHINERY

Redesigned kiln gun features Martini action



WINCHESTER-WESTERN DIVISION, Olin Mathieson Chemical Corp., 460 Park Ave., New York 22, N.Y., has developed a redesigned kiln gun, the Ringblaster, for shooting out clinkers from rotary kilns. Capable of developing a muzzle energy in excess of 7,500

ft.-lb., it weighs about 150 lbs.

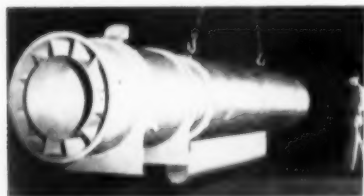
New levels in speed and safety are said to be set with the new gun, which features Martini action. When the breech is opened, the top of the breech block forms a loading tray which speeds the firing cycle. Other features are a special handle linkage which permits the shooter to hold onto the handle during the firing cycle and a muffler which reduces firing noise.

A protective mount encloses all the recoiling parts, providing protection for the shooter, and the gun's heavier barrel and heavier springs also increase the safety factor.

Western Super-X eight-gauge kiln gun shells used with the gun are shaped to deliver a smashing rather than a penetrating blow.

Enter 300 on Reader Card

Wet type dust collector

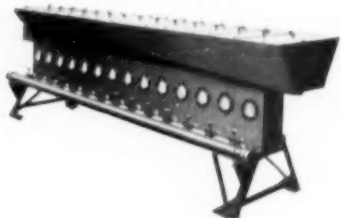


JOY MANUFACTURING CO., Henry W. Oliver Building, Pittsburgh 22, Pa., has developed the Joy "Microdyne" dust collector of the wet inertial type. Compact in size, it is said to be 1/10 to 1/20 the size of comparable units, and can be installed directly in a duct line.

The unit is made up of three double walled cylindrical sections with a fan mounted end to end to result in a smooth cylinder. The first section is a cleaner section, containing water spray and impingement screen assembly. The second or water eliminator section is an axial type cyclone containing turning and straightening vanes. The third, transition section accommodates the Joy axial flow fan. Sizes are available to clean from 1,500 to 48,000 cfm. of dust laden air.

Enter 301 on Reader Card

Hydraulic classifier



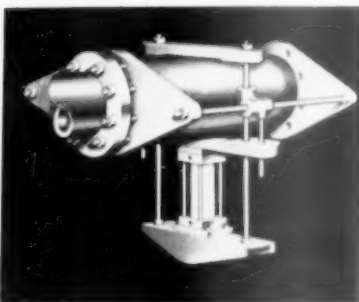
THE DEISTER CONCENTRATOR CO., 901-935 Glasgow Ave., Fort Wayne 1, Ind., announces its newest type Model SV Concenco Constriction Plate Classifier. The model is designed for sand-plant operations, removing minus 100

mesh material and splitting fine sand into a variety of sized products to meet rigid specifications.

The classifier features double-stage classification of the feed. Following primary classification stage in each main cell, a secondary cell in the spigot circuit provides a final sharpening of the sizing. Accepting material as coarse as 1/4 in., the unit, on feed containing sizes from 1/4 in. to fine slime will produce simultaneously as many classified spigot products as there are cells, plus a slime overflow.

Enter 302 on Reader Card

New pinch valve models



MINE AND SMELTER SUPPLY CO., 3800 Race St., Denver, Colo., has introduced new models of the Massco-Grigsby pinch valves for handling abrasive and corrosive pulps and liquids. The valves are available with either rubber or neoprene sleeves, in sizes from 1-in. to 14-in. inside diam., for pressures to 150 psi. and temperatures to 200 deg. F.

A new feature is the Hydral-Air operating mechanism consisting of an air-hydraulic pump which can be installed as a centralized unit for operating several valves. It also can be equipped for automatic regulation. A torque arm reducer for manual operation and a motorized unit are other operating mechanisms. Remote control is possible on all three types.

Recesses molded into opposite sides of the sleeve interior serve as hinges during compression, preventing undue strain. The sleeve is belled on both ends and designed to fit between spilt flanges and standard pipe flanges.

Enter 303 on Reader Card

(Continued on page 150)

Bucyrus-Erie Ward Leonard electric shovels have a proved record of profitable operation. They can bring that performance to *your* quarry.

From treads to boom point, sturdy construction is apparent in every part. Because Bucyrus-Erie has *both* large, modern welding shops and foundry facilities unsurpassed in the industry, the process can be used that provides the ultimate in strength and durability for each part. This heavy-duty construction holds down maintenance costs and extends profitable machine life.

and deceleration of driving motors . . . high torque or high speed at the right times to speed over-all work cycles.

Cash in on the Bucyrus-Erie profit-turning traditions. Write for information on electric shovels for *your* quarrying needs. 148152

GLOBAL APPROVAL

10-B 4 1/2-cu. yd.
 150-B 6-cu. yd.
 190-B 8-cu. yd.

BUCKHILL GATE

UNITED STATES CANADA MEXICO SOUTH AFRICA AUSTRALIA
 ARGENTINA BRAZIL CHINA HONG KONG INDIA JAPAN
 SOUTH KOREA TAIWAN THAILAND UNITED KINGDOM

149

NEW MACHINERY

(Continued from page 148)

Small particle counter

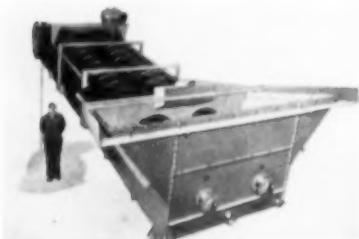
COULTER INDUSTRIAL SALES CO., P.O. Box 22, Elmhurst, Ill., is introducing the Coulter Counter, presently available in Model A. Said to bring a new approach to small particle measurements, the apparatus accomplishes particle content and size distribution measurement of microscopic particles in the 1 to 100 micron range.

The Coulter counter is based upon a principle involving the forced passage of a fluid suspension of particles through a small aperture having an electrode on each side. As a particle passes through, aperture resistance changes in proportion to particle size and the resultant series of electrical pulses is electronically scaled and counted. Curves of cumulative particle frequency vs. particle size are obtained directly, and weight and area distributions are readily derived from these.

Virtually any type of particle may be measured. All that is required is a fluid suspending medium which is an electrical conductor. Either the fluid or the particulate material may be the better conductor and a conductivity ratio of 3:2 or better is sufficient.

Enter 312 on Reader Card

Fine Material Screws



EAGLE IRON WORKS, 129 Holcomb Ave., Des Moines, Iowa, has introduced a larger model washer-classifier-dehydrator for fine material, in both single and double screw units. Screw diameter is 54 in. and tub length is 34 ft. Normal screw speed is said to be 14 rpm.; capacity of the single screw is 250 tph., and of the double screw, 500 tph.

Of heavier construction than smaller units, the screws are of the ribbon type, consisting of sheet steel spiral welded to the shaft with replaceable Ni-Hard chrome-nickel alloy iron shoes on the wearing edge of the screw. An improved feed box, designed to reduce turbulence in the settling pool area, flows in material in a flat ribbon below the water line.

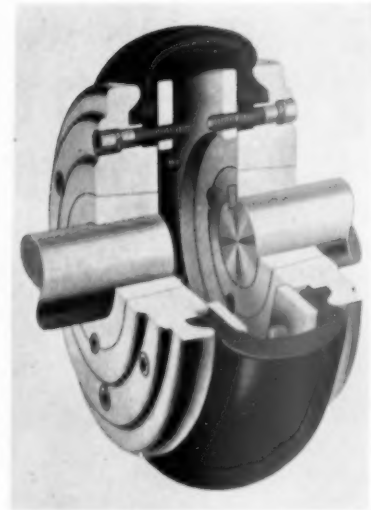
Enter 313 on Reader Card



Flexible cushion coupling has rubber tire design

DODGE MANUFACTURING CORP., Mishawaka, Ind., announces Para-flex, described as a new conception in flexible couplings for engineering applications. Advantages claimed for the coupling include ability to handle angular misalignment up to 4 deg., parallel misalignment up to 1/8-in., and end-float to 5/16-in., contingent upon the size of the coupling and duration of the conditions—or it will take all of these simultaneously. The coupling also cushions shock loads and diminishes torsional vibration.

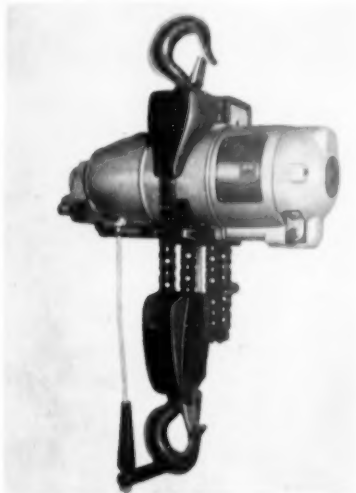
Heart of the Para-flex coupling is a tire with synthetic tension members



bonded together in rubber. The tire, which has a transverse split molded into it to permit easy installation and replacement, is clamped between two hubs mounted on the shafts to be coupled. The flexible member is held between the flanges and clamp rings of the hubs and can be removed without disturbing alignment of hubs. Para-flex will be available in capacities up to 600 hp. at 900 rpm.

Enter 314 on Reader Card

Air-powered hoist



KELLER TOOL DIVISION, Gardner-Denver Co., Grand Haven, Mich., has added a 4,000-lb. capacity hoist to its line of air-powered hoists. Fitted with either roller or leaf chain, the lifting and lowering speed varies from a creep to 10 fpm. at full load and 90 psig. air-line pressure. Length of lift is 8 ft.

Enter 316 on Reader Card

Hoe attachment



LINK-BELT SPEEDER CORP., 1201 Sixth St. S. W., Cedar Rapids, Iowa, has unveiled a 3-cu. yd. hoe attachment for use with its 3-cu. yd. Model K-608. With the new attachment the K-608 now can be used as hoe, shovel, crane, clamshell or dragline.

The attachment has a 30-ft. boom.

Enter 315 on Reader Card

(Continued on page 152)

WINSLOW

Full-Flow

FILTERS

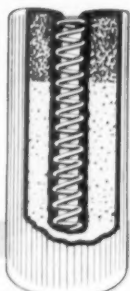
Case History Report No. 32 Shows Why Engines

Protected by WINSLOW FILTERS Last Longer

A bank accident in the spring of 1955 dropped this D-7 bulldozer into 20 feet of water for 24 hours. After crankcase, radiator and other oil and grease containers were drained and flushed, and the tractor completely cleaned, it was put back to work and has operated *ever since* without overhaul, because it was protected by Winslow full-flow filtration.



Time Between Overhauls Doubled On Texas Firm's Diesel Engines



The CP* Principle

Winslow patented CP* (Controlled Pressure) elements are designed to continuously self-adjust the pressure within the filter and allow for a full stream of filtered oil without opening bypass valves. This is accomplished through the dual flow capacity, with two types of material.

Since 1952 all powered equipment of Gifford-Hill & Company, Inc., with fifteen plants producing aggregates and concrete in Texas and Louisiana, has been protected with Winslow Full-Flow Filters. This includes dozens of diesel locomotives, tractors, ready-mix trucks and draglines, with several makes of engines.

Before installing Winslow Filters, the time between overhauls on heavy duty diesels ranged from 3,000 to 6,000 hours, depending on the type of engine and service. Now the time between overhauls is 6,000 to 12,000 hours, a tremendous saving in down time as well as overhaul costs, plus substantially longer operating life for the engines. Corresponding improvements are made on other types of equipment.

Fuel Filters, Too

All equipment at Gifford-Hill is further protected by Winslow Fuel Filters, which remove moisture, acid, dirt and other impurities from fuel oil, to protect working parts and improve performance on all types of engines.



For complete data on the application of Winslow Filters, please write or call

WINSLOW

ENGINEERING & MANUFACTURING COMPANY

4069 Hollis Street, Oakland, California

CP* is fully protected by patents and trademarks

Enter 1631 on Reader Card

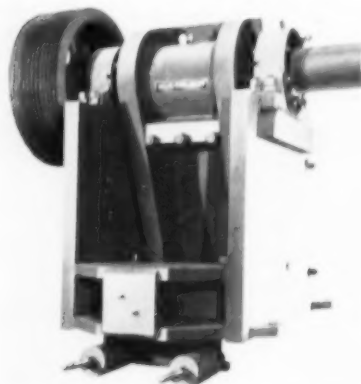
ROCK PRODUCTS, July, 1957

151

NEW MACHINERY

(Continued from page 159)

Single-toggle jaw crusher



ALLIS-CHALMERS MANUFACTURING Co., Milwaukee 1, Wis., announces Model ST heavy-duty single-toggle jaw crusher which has a capacity range between 180 and 360 tph. The model is said to combine the features of single- and heavier double-toggle machines, and is designed for mines, quarries and gravel plants where stone or ore is suitable for single-toggle action.

The crusher weighs 61,000 lb. and is

designed with stress allowances standard for A-C double-toggle jaw crushers built for primary crushing duty. The crusher features a single grooved flywheel and a crushing chamber designed to even out the crushing load and lower flywheel energy requirements. It is available in two sizes: one, 30 x 42 in., and the other, 42 x 54 in.

Enter 308 on Reader Card

Loader with backhoe



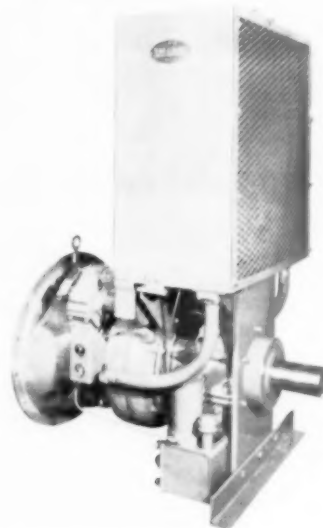
THE OLIVER CORP., 400 W. Madison St., Chicago 6, Ill., is making available the Oliver OC-46 loader with backhoe attachment. The basic compact unit has

simplified trencher mounting and features a 22 bhp. engine with four-speed transmission. Easy tractor operation and fast-acting hydraulic loader controls are said to provide for speed and maneuverability, and the heavy, rigidly mounted frame provides for additional loader strength.

The OC-46 has a $\frac{5}{8}$ -cu. yd. bucket with increased roll-back and dump angle. The crawler assembly has four lower track wheels and deep full-length side panels. Track gauge is 46 in. The unit has a two-point hitch design for coupling with the Oliver Jet Trencher. The trencher digs to 11 ft., loads to 8 ft. 10 in., and has full 180-deg. boom swing, the company states.

Enter 309 on Reader Card

Three-stage torque converter



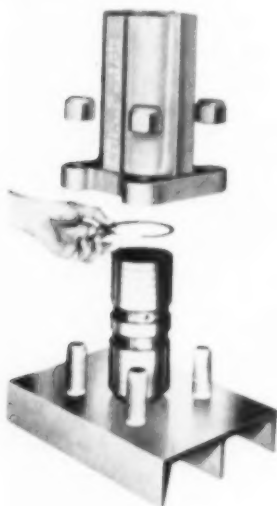
TWIN DISC CLUTCH CO., Hydraulic Division, Rockford, Ill., has announced production of a new heavy-duty version of the 11,500 series three-stage torque converter. The new unit has a maximum rating of 586 hp. at 2,200 rpm. Impellers are available for specific torque ratings of 340, 390, 450 and 540 lb.-ft. Maximum input torque is 1,400 lb.-ft. Current production units include Models CF, providing a clutch at the flywheel and F, connected to the flywheel with a driving ring. Both Models CF and F are designed for SAE No. O flywheel housings.

A Twin Disc C-3 rear end, with output shaft supported by two heavy-duty roller bearings, is available with either model, permitting maximum sidepull to be taken from the torque converter. Available optionally is a radiator integrally supported as part of converter.

Enter 310 on Reader Card

END

New air-operated vibrator is 50 percent lighter



THE CLEVELAND VIBRATOR CO., 2828 Clinton Ave., Cleveland, Ohio, is marketing a new two-part air-operated vibrator, type KO. Available with a 2 or a 4 in. diam. piston, the KO has been used to move all types of bulk materials, including cement, sand and gravel through bins, chutes, hoppers and tubes.

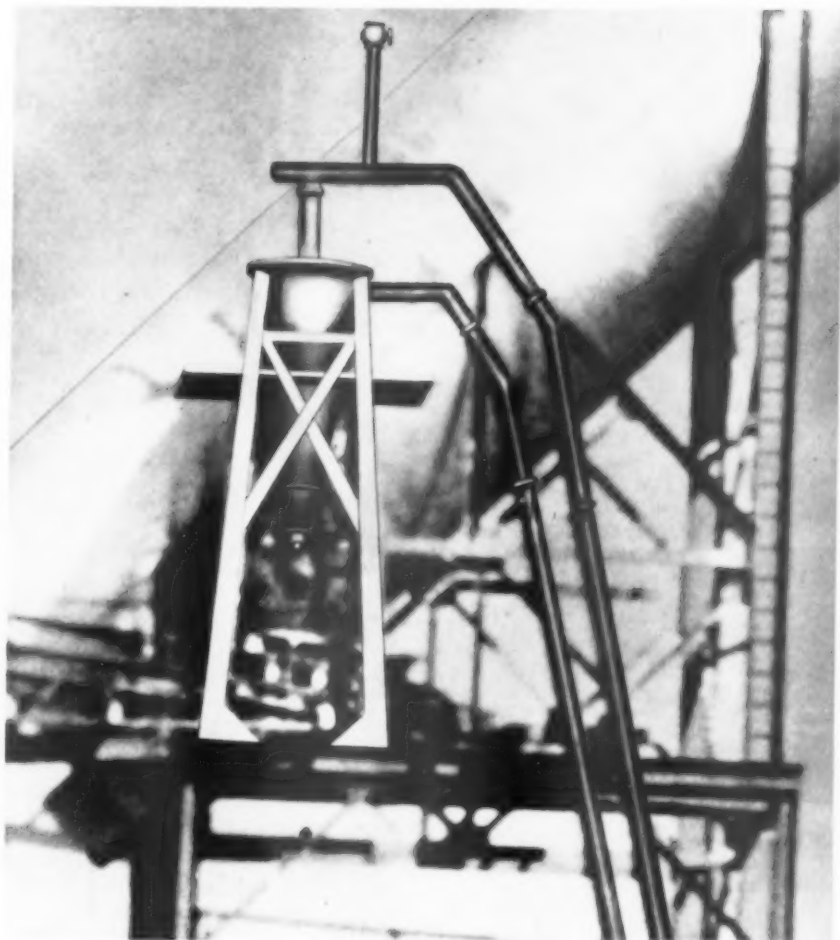
The steel piston is housed in a cast aluminum or semi-steel cylinder block.



The assembly is bolted either directly to the bin or to a base plate welded on the bin. Substantial weight savings are made by using an aluminum cylinder. The 2-in. KO weighs 60 lbs., and the 4-in. model, 79 lb.

The KO is permanently lubricated with molybdenum disulfide, dry film lubricant which is sprayed and baked onto the piston and cylinder.

Enter 311 on Reader Card



**DICK ARTHUR
PROJECT
SILKIRK, MANITOBA,
CANADA**

45" DURACLONE ALONE....

- Classifies
- Cleans
- Dewateres . . .

**150 TPH Silica Sand—
Ready for Shipment . . .
at less than 10¢ per ton**

Eliminating conventional dewatering or washer equipment between the cone and the screens, a 45" DURACLONE is completely processing an average of 150 TPH of clean silica sand. Outstanding is the fact that the sand, moisture content as low as 13.5%, can be shipped immediately.

On the Dick Arthur Project, Silkirk, Manitoba, Canada, minus-10-mesh pit-run slurry (32% moisture) is pumped to the DURACLONE inlet, the underflow can be discharged direct to gondola cars or to conveyor for stockpiling.

In the process, requiring only one pumpman, removal of extreme fines of iron, alumina, and other deleterious matter adds beneficiation to the product which compares favorably with the silica sand produced at Ottawa, Illinois.

Production figures accumulated during 1956 indicate that costs of less than 10 cents per ton of dry weight finished sand have been averaged. Included

in the above are overall operating costs, as well as the five year DURACLONE write-off expense.

H. B. Large Engineering Company, Pasadena, California built and supervised two DURACLONE installations along with Haggard Equipment Company of Winnipeg, Canada. All tests were performed by the National Testing Laboratory, Winnipeg, Canada. Copies of the findings on this project are available from H. B. Large Company.

H. B. Large Company are sand recovery specialists and manufacture DURACLONES in sizes from 50 GPM up to 3200 GPM capacities. DURACLONES pay for themselves in the specification fines recovered from conventional washer wastes. All DURACLONES are rubber-lined for extra life. DURACLONES are guaranteed to perform as claimed.

Let us tell you about how DURACLONE can solve your sand-recovery problems. Wire or telephone now telling us the GPM to be handled. There is profit in your waste, let us show you.

DURACLONE—Supplied and Guaranteed by

H. B. LARGE ENGINEERING COMPANY

262 South Parkwood Ave.

Pasadena, California

Telephone: SYcamore 2-7820

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ROCK PRODUCTS, July, 1957

153

MANUFACTURERS

NEWS

Frank G. Hough retires



The Frank G. Hough Co., Libertyville, Ill., has announced the retirement of Frank G. Hough, founder and chairman of the board. A pioneer in the bulk materials handling and tractor-shovel fields, Mr. Hough designed and sold his first hydraulic shovel attachment in 1922 while vice-president and general manager of the Blair Mfg. Co., Chicago, which he acquired in 1931 and incorporated into The Frank G. Hough Co. in 1933. The company moved from Chicago to Libertyville in 1939 at which time manufacturing and service facilities were established. Since that time the plant has expanded from 14,000 sq. ft. to almost 400,000 sq. ft. In 1952 stock of the company was purchased by International Harvester Co. and it is now operated as a wholly owned subsidiary.

Joseph T. Ryerson & Son, Inc., Chicago, Ill., has announced a \$1,000,000 expansion program at its Pittsburgh, Penn., steel service plant which will increase floor space to more than 200,000 sq. ft.

Huber-Warco Co., Marion, Ohio, has announced the election of Jacques Jones as president to succeed Don A. Howard, president since 1943, who has retired after 33 years of service, but continues as a member of the board of directors. Mr. Jones had served as executive vice-president since the former Huber Mfg. Co. and the

former W. A. Riddell Corp., where he served as vice-president and general manager, were combined a few years ago. Mr. Howard joined the Huber Mfg. Co. in 1924 as treasurer and became secretary and a director in 1929. He was elected vice-president in 1942 and president in 1943.

Union Carbide and Carbon Corp., New York, N.Y., has changed its name to Union Carbide Corp., according to an announcement by Morse G. Dial, president. The names of three divisions have also been changed. Carbide and Carbon Chemicals Co. has become Union Carbide Chemicals Co.; Linde Air Products Co. has changed its name to Linde Co.; and Carbide and Carbon Realty Co. will be known as Union Carbide Realty Co.

Le Roi Division, Westinghouse Air Brake Co., Milwaukee, Wis., has named Don S. Permar as assistant general sales manager in addition to his duties as field sales manager. Mr. Permar joined the company in 1945 as a pneumatic engineer. He has been field sales manager for Le Roi division since 1954. Prior to that he was sales manager of stationary air compressors.

Sales department changes made at Allis-Chalmers



K. A. New



J. M. Haile



V. M. Holloway

Allis-Chalmers Mfg. Co., Milwaukee, Wis., announces creation of a new department in the sales organization of the construction machinery division and the promotion of V. M. Holloway, assistant sales manager of the division, as head of the department, which will devote full time to dealers and their sales organization.

Company founder is honored



Byron Pyle, left, executive vice-president and son-in-law of Joseph E. Kennedy, receives portrait from Fred O. Reedy, president, right. Mr. Kennedy is seated

Kennedy-Van Saun Mfg. & Eng. Corp., New York, N.Y., employees, members of the Kennedy family, friends and business associates gathered at Danville, Penn., to pay tribute to Joseph E. Kennedy, founder and chairman of the board, to celebrate his 94th birthday. Guests from three nations and from six states attended the dinner. A portrait painting of Mr. Kennedy was presented to the Kennedy family by Fred O. Reedy, president of the company.

J. M. Haile, who has been eastern territory manager of the division, succeeds Mr. Holloway as assistant sales manager, and K. A. New, formerly construction machinery district manager in the metropolitan New York area, succeeds Mr. Haile as eastern territory manager.

(Continued on page 156)

Crushing 60,000 lbs. per week

of glass-sharp, extremely abrasive material is the job of these hammermill hammers. No wonder they become rounded and worn, as shown below . . . lose their cutting efficiency, require regular build-up.



HARDFACING WITH AMSCO[®] SUPER HF-20 *doubles service life . . . cuts electrode costs*

Welding Flux Processing, Chicago Heights, Illinois, know a good thing when they see one. That's why they've switched *exclusively* to Amsco Super HF-20 Electrodes for hardfacing of these hammers. They're saving three ways:

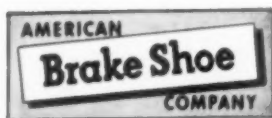
1. Service life of the built-up hammers and the mill housing itself has been doubled, because of Super HF-20's high abrasion resistance.
2. Super HF-20 electrodes cost about 40% less than the type previously used.
3. Welding speed is stepped up. Super HF-20,

an iron powder "contact" electrode, is easy to handle and gives a high deposition rate.

In this and many other severely abrasive applications, Amsco Super HF-20 has *proved* its ability to provide superior wear resistance at low cost. Available from stock in $\frac{3}{16}$ " diameter, to handle hardfacing jobs of almost any size.

Call your nearby Amsco Welding Distributor now for a demonstration of Super HF-20. Or write direct for technical data to: Amsco Welding Department, Chicago Heights, Ill.

Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.



AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

Enter 1572 on Reader Card

ROCK PRODUCTS, July, 1957

155

MANUFACTURERS NEWS

(Continued from page 151)

W. B. Leach president of firm



Mexico Refractories Co., Mexico, Mo., has announced the election of W. Basil Leach as president of the company to succeed John B. Arthur, who has been named chairman of the board and chief executive officer. Mr. Leach, formerly vice-president and director of sales, has been associated with the firm since its formation in

1929. C. A. Smith, vice-president and chief engineer, has been appointed executive vice-president in addition to his duties as chief engineer. Carl H. Bachmann, a director and production manager of the Mexico, Mo., plant, has been elected a vice-president. Roger A. Hitchins, vice-president and general manager of the national refractories division, and P. J. Geib, assistant treasurer, have been appointed to the board of directors.

Boston Woven Hose & Rubber Co., Boston, Mass., has merged with the American Bilrite Rubber Co., Inc., Chelsea, Mass., and will be operated as the Boston Woven Hose & Rubber Co. division of Bilrite. Former officers of Boston Woven Hose continue as officers of the division.

American Brake Shoe Co., New York, N.Y., announces that Arthur Nettenstrom has been appointed executive assistant to the president of the AmForge division. Francis Moore has been named sales assistant to the president; Robert Crocombe, vice-president in charge of sales and Stanley Dawson, vice-president in charge of operations.

Mr. Nettenstrom, formerly first vice-president, has been with the firm since 1924. He was appointed vice-

president of the division in 1940, and became first vice-president in 1943. Mr. Moore, formerly vice-president of sales, joined the firm in 1919 as shipping and production foreman. He was made vice-president in 1941. Mr. Crocombe, formerly assistant vice-president of sales, joined American Brake Shoe in 1937 as an apprentice, and was appointed assistant vice-president in 1953. Stanley Dawson joined the company in 1954 and formerly was technical assistant of sales.

Cleveland Formgrader Co., Avon, Ohio, has appointed Charles L. Driscoll as chief engineer. He was formerly senior project engineer with General Motors Corp.

Hewitt-Robins, Inc., Stamford, Conn., has announced construction of a new 60,000 sq. ft. manufacturing plant at King-of-Prussia, Penn., for the production of industrial wire cloth and wire mesh conveyors, to replace facilities now in Philadelphia.

Western Precipitation Corp., Los Angeles, Calif., has appointed Walter L. Penick as industry engineer for the mining and metallurgical industries. Recently R. G. Gaw and R. J. Plass were appointed industry engineers for the steel and cement industries, re-



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Years of experience in the Multiwall field, backed by vast paper resources and extensive manufacturing facilities, assures you a *practical* answer to your packaging problems. Let a Raymond Representative show you how with a Raymond Multiwall!

Raymond BAG CORPORATION
DIVISION OF ALBERMARLE PAPER MFG. CO.

MIDDLETOWN, OHIO • RICHMOND, VIRGINIA
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SEVERE USE
and even abuse**

One word describes a Hayward — ruggedness. Yea, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity, little if any upkeep, high operating efficiency! Details on request. Write: THE HAYWARD COMPANY, 50 Church St., New York 7, N. Y.

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BUCKETS**

CLAM SHELL - ELECTRIC - ORANGE PEEL - GRAPPLES
famous for performance since 1888

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NOTIFY US OF CHANGE
OF ADDRESS TO
ASSURE PROMPT
DELIVERY OF EACH
ISSUE OF
ROCK PRODUCTS

spectively. Mr. Penick has been associated with the company for 20 years and for many years has served as district sales manager for the northwest area with offices in San Francisco.

Head two companies



Howard Dingle



George H. Acker

The Cleveland Worm & Gear Co. and its affiliate, The Farval Corp., Cleveland, Ohio, announce the election of George H. Acker as president and Howard Dingle as chairman of the board of both companies. Formerly executive vice-president, Mr. Acker became associated with the Cleveland Worm & Gear Co. in 1923 and was named chief engineer in 1925. He was appointed vice-president in charge of engineering and production in 1942 and executive vice-president in 1952.

Mr. Dingle, who joined the organization as vice-president and general manager, has been president since 1927.

Barber-Greene Co., Aurora, Ill., has announced the promotion of W. E. Putz as administrative assistant to E. H. Holt, vice-president and director of sales. He was formerly advertising manager and will be succeeded by Charles E. Parkin, technical editor in the advertising department. Mr. Putz joined the company in 1950.

St. Regis Paper Co., New York, N.Y., announces that Hugh W. Sloan has been elected a vice-president in addition to his duties as vice-president and managing director of St. Regis Paper Co. (Canada) Ltd. Mr. Sloan will make his headquarters in New York. L. R. Macrae, Montreal, who was recently elected a vice-president of the Canadian subsidiary, will be responsible for Canadian operations under Mr. Sloan's direction.

Virginia-Carolina Chemical Corp., Richmond, Va., announces that John R. Thompson, formerly with Union Bag-Camp Paper Corp., has joined the V-C bag division as sales coordinator, with headquarters in New York City.

Philip S. Hill to direct operations of Hyster Co.



Hyster Co., Portland, Ore., has announced the appointment last December of Philip S. Hill, vice-president in charge of sales, as executive vice-president in charge of all operations. Mr. Hill, who has been with Hyster for 20 years, has served in sales, service, engineering, purchasing and production management capacities.

(Continued on next page)

PLATEGRIP

PLATE FASTENERS FOR CONVEYOR BELTS



Make strong dust-tight, water-tight joints in belts of any width. Special design spreads tension uniformly across belt, allow natural troughing of belt and assures smooth operation over flat, crowned or take-up pulleys. Sizes for belts of from 1/4" to 1 1/2" thickness. Write for Catalog Sheet.

ARMSTRONG BRAY & CO.
5386 Northwest Highway, CHICAGO 30, U. S. A.

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- We maintain crews of experienced masons and equipment for the lining of cement kilns; also the furnishing and erection of suspended walls and arches for clinker coolers.
- We are also equipped for the pneumatic placement of refractories in kilns and housings.
- If you are interested in low cost and a trouble-free installation, we are in a position to contract this work on a lump sum contract basis.
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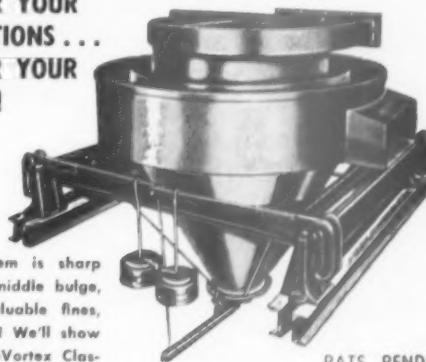
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AUTO VORTEX CLASSIFIERS...

MOST EFFICIENT BY ANY MEASURE FOR SINGLE OR MULTIPLE SPLITS!

COMPARE RESULTS . . . COMPARE COSTS . . . AGAINST ANY OTHER SAND GRADATION EQUIPMENT! AFTER SUCH COMPARISON, YOU, TOO, WILL BUY AUTO-VORTEX CLASSIFIERS . . .

WHATEVER YOUR SPECIFICATIONS . . . WHATEVER YOUR PROBLEMS!



PATS. PEND.

If your problem is sharp splits, excess middle bulge, or loss of valuable fines, write us today! We'll show you how Auto-Vortex Classifiers do the job!



CHARLES E. WOOD COMPANY

906 NORTH WATER ST. • MILWAUKEE 2, WISCONSIN

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STEEL

**Every Kind
Quick Delivery**

**Plates, Structural,
Bars, Sheets, Tubes, etc.
Carbon, Alloy, Stainless
Steels, Babbitt Metal.**

RYERSON

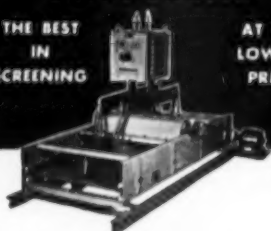
Joseph T. Ryerson & Son, Inc. Plants at
New York • Boston • Wallingford, Conn.
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AT THE
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**THE MOST MODERN AND EFFICIENT
ELECTRIC HEATING EQUIPMENT
AT A REASONABLE PRICE**

•VIBRATING SCREENS-

All sizes and types

•UNILEC HEATING EQUIPMENT

•UNIFLEX VIBRATORS

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WRITE FOR CATALOG NO. 150

**UNIVERSAL
VIBRATING SCREEN CO.**
Racine, Wisconsin
Quality Screens Since 1919

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MANUFACTURERS NEWS

(Continued from preceding page)

**William S. Little new board
chairman of Bucyrus-Erie**



Bucyrus-Erie Co., South Milwaukee, Wis., has elected William L. Little, president, as chairman of the board to succeed William W. Coleman, who has retired as chairman of the board and of the executive committee after 52 years of service. Mr. Coleman, who served as president for 32 years, has been named honorary chairman of the board. He has been chairman of the board since 1927 and of the executive committee since 1941.

Mr. Little, president of Bucyrus-Erie since 1952, has been associated with the company for 31 years. Before becoming president he had been executive vice-president for two years and a director since 1947.

Lyle S. Cline has been named vice-president and secretary, and David W. Harris, vice-president. Albert S. Puelicher, president of the Marshall and Ilsley Bank, Milwaukee, was elected chairman of the executive committee to succeed Mr. Coleman.

The Coe Mfg. Co., Painesville, Ohio, announces the death on April 20, of Frank W. Milbourn, Sr., president of the company. He was 75 years old. Born in Lexington, Ky., Mr. Milbourn was educated in mechanical engineering at the University of Kentucky. He became associated with the Southern Engine & Boiler Works, Jackson, Tenn., where he served as general manager until 1919, when he acquired The Coe Mfg. Co. Since his retirement a few years ago, active management of the company has been under the direction of Frank W. Milbourn, Jr., vice-president and manager.

(Continued on next page)

FOR SALE

SURPLUS MINING EQUIPMENT

36" Conveyor—150 HP Allis Chalmers Motor—P & H Model 1053 Diesel Shovel—Bucyrus Erie Churn Drills (1-Model 27-T and 1-Model 29-T)—Bucyrus Erie Bit Dressers (1-#8 and 1-#12)—Stewart Model 4554 Sunbeam Furnace—Spare Parts.

All of the above equipment in fair to excellent condition.

For complete information, write:

**General Superintendent
Vermont Asbestos Mines Division
The RUBEROID Co.
Hyde Park, Vermont**

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You're Sure with Merrick



**FOR Positive Controlled
Feed by Weight of Sand
Gravel, Lime Clinker,
Gypsum or other materials to Process—**

Use the Feedweight

MERRICK SCALE MFG. CO.
180 AUTUMN STREET - PASSAIC, NEW JERSEY

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MANUFACTURERS NEWS

(Continued from preceding page)

Air Reduction Co., Inc., New York, N.Y., has announced a \$3,000,000 expansion that will more than double production facilities at the Lorain, Ohio, plant. Construction is expected to start in July and be completed in a year.

Southwestern Engineering Co., Los Angeles, Calif., won first place for its "outstanding advertising series" in the category of literature, bulletins and printed matter in the recent National Industrial Advertisers Association contest. Robert C. Wayne, advertising manager, and Robert W. Kenagy, assistant advertising manager, were present at the award.

Lamson Corp., Syracuse, N.Y., announces the appointment of W. Gerald Lanterman as manager of sales of the industrial division. He was formerly Cleveland regional manager and prior to that served as district manager in Philadelphia for 15 years. John L. Baldrige, formerly district manager in Dallas, Texas, has been named district manager of the southern region with headquarters in Atlanta, Ga.

J. S. Anderson directs sales



The Babcock & Wilcox Co., New York, N.Y., announces that James S. Anderson, formerly general sales manager of the tubular products division, has been elected a vice-president in charge of sales for that division, with headquarters in Beaver Falls, Penn. Mr. Anderson joined B & W in 1941 as a district salesman in the division's New York office. He was named assistant manager in 1942 and assistant general sales manager in 1948. He was made sales manager in 1953.

Borg-Warner Corp., Chicago, Ill., has elected Robert W. Murphy, vice-president and general counsel, as chairman of the executive committee, and George P. F. Smith, eastern representative, as a vice-president. Mr. Murphy, who succeeds G. A. Shallberg, Sr., who has retired, has been with Borg-Warner since 1937. Mr. Smith, who joined the firm in 1938, has also been appointed manager of the Washington, D.C., office to succeed Karl J. Ammerman, who has retired.

Gardner-Denver Co., Quincy, Ill., has announced the election of George W. Gutekunst, general sales manager, as a vice-president of the company. C. H. Rieman, general manager of the Denver plant, and Brice D. Maddox, general manager of the Keller tool division, also are new vice-presidents.

Chase Bag Co., Chicago, Ill., has announced election to membership on the board of directors of William N. Brock, vice-president and general sales manager; Francis H. Ludington, Jr., vice-president in charge of production and engineering and Leland S. Brown, vice-president of The First National City Bank of New York.

END

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builders
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HIGH-SPEED dewatering screens are designed, built and installed by McNally Pittsburg, and operating throughout the Western World.

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McNally Pittsburg Offers:

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Roller Chain
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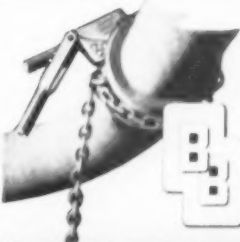
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DREDGE
SLEEVE
CLAMPS**

STURDY • PRACTICAL • DEPENDABLE • ECONOMICAL



Furnishes a positive seal for round flexible joints. Used by leading dredging and hydraulic sand-and-gravel operators, and the U. S. Engineering Corps. This Multi-use chain sleeve clamp is easy to apply . . . positive in action. Write for illustrated folder, today.

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ROCK PRODUCTS, July, 1957

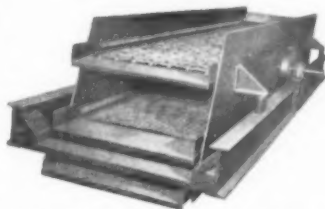
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159

BONDED EQUIPMENT BARGAINS

NEW CURRENT MODELS IMMEDIATE SHIPMENT FROM OUR FACTORY - WRITE, WIRE OR PHONE

NEW BONDED® HEAVY DUTY VIBRATING SCREENS



HEAVY DUTY MODELS, TYPE BS: Four bearing positive throw eccentric shafts; 3' x 6' to 5' x 14', 1 to 5 decks. Write for New 8-page Bulletin No. 1087.

Model Number	No. of Decks	Screening Area	Sale Price \$
124AS	1	2' x 4'	443
224AS	2	2' x 4'	472
126AS	1	2' x 6'	472
226AS	2	2' x 6'	501
136AS	1	3' x 6'	581
236AS	2	3' x 6'	688
186AS	3	3' x 6'	956
286AS	1	3' x 8'	675
288AS	2	3' x 8'	815
388AS	3	3' x 8'	996
386BS	3	3' x 6'	1303
486BS	4	3' x 6'	1447
188BS	1	3 x 8'	1231
288BS	2	3 x 8'	1282
388BS	3	3 x 8'	1375
248BS	2	4' x 8'	1843
348BS	3	4' x 8'	2035
2410BS	2	4' x 10'	1953
3410BS	3	4' x 10'	2305
2412BS	2	4' x 12'	2319
3412BS	3	4' x 12'	2635
4412BS	4	4' x 12'	2833

NEW BONDED® GENERAL DUTY VIBRATING SCREENS



GENERAL DUTY SCREENS, TYPE AS: Eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. Write for New 8-page Bulletin No. 1086.

For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals, including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Complete Pre-Fab sections quickly and easily joined together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2 1/4" or 2 1/2" diam. shaft. Belt is new 4-ply, 28-oz. duck, 1/2" top rubber cover x 5/8" bottom cover and is fresh stock made by leading manufacturers.

Remember,
You Save
Up To
50%



CONVEYOR PRICES
INCLUDE BELTING

Belt Width	Length of Conveyor	List Price	Sale Price
14"	50'	\$1397	\$ 722
14"	60'	2222	1144
14"	85'	3377	1733
16"	20'	1262	636
16"	45'	2137	1088
16"	60'	2662	1359
16"	90'	3712	1900
18"	25'	1477	794
18"	45'	2217	1166
18"	70'	3142	1648
18"	85'	3697	1933
18"	100'	4252	2220
18"	130'	5362	2797
20"	25'	1517	828
20"	60'	2882	1533
20"	75'	3467	1838
20"	90'	4052	2146
24"	25'	1590	890
24"	45'	2430	1230
24"	70'	3480	1875
24"	100'	4740	2514
24"	120'	5580	2950
24"	150'	6810	3603
30"	50'	2911	1617
30"	70'	3871	2119
30"	90'	4831	2614
30"	25'	1818	1118
36"	45'	2858	1678
36"	60'	3638	2096
36"	100'	5718	3214

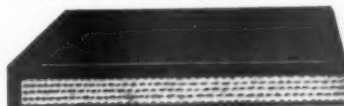
For conveyors longer or shorter than those listed above, add or deduct the following per foot prices according to belt width. Prices include belting. Write for Bull. #1138.

For 14" belt	\$16.84 per foot
For 16" belt	18.04 per foot
For 18" belt	19.24 per foot
For 20" belt	20.37 per foot
For 24" belt	21.78 per foot
For 30" belt	24.75 per foot
For 36" belt	27.95 per foot

Bonded troughing idler conveyors are also available with truss type construction. Write for Bulletin #1189 and prices.

NEW CONVEYOR BELTING SAVE UP TO 25%

Heavy duty 4-ply, 28 oz. duck 1/2" top rubber cover by 5/8" bottom cover 12 1/2" to 15 1/2" average friction pull; 800# to 1000# average cover tensile rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.



Width	Ply	List Price	Sale Price
14"	4	\$3.52 foot	\$2.83 foot
16"	4	3.96 foot	2.97 foot
18"	4	4.38 foot	3.29 foot
20"	4	4.83 foot	3.80 foot
24"	4	5.68 foot	4.26 foot
30"	4	6.97 foot	5.21 foot
36"	4	8.26 foot	6.18 foot

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, 1/2" top rubber cover x 5/8" bottom rubber cover, 16 1/2" to 19 1/2" average friction pull, 2500# to 3000# average cover tensile belting. This belt is for more severe service, high tonnage and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal and other similar materials, both wet and dry. Belt has molded rubber edge.

Width	Ply	List Price	Sale Price
16"	4	\$4.71 foot	\$3.46 foot
18"	4	5.23 foot	3.83 foot
20"	4	5.73 foot	4.37 foot
24"	4	6.74 foot	4.94 foot
30"	4	8.28 foot	6.07 foot
36"	5	7.90 foot	5.78 foot

The following belts are 5-ply, 32 oz. duck:

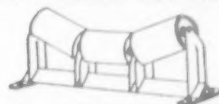
Width	Top Cover	Bottom Cover	List Price	Sale Price
24"	1 1/2"	1 1/2"	\$ 8.56 Ft.	\$ 6.42 Ft.
30"	1 1/2"	1 1/2"	10.52 Ft.	7.89 Ft.
36"	1 1/2"	1 1/2"	14.21 Ft.	10.66 Ft.

A heavier duty 28 oz. duck belt with 1/2" top rubber cover x 5/8" bottom rubber cover having 3500# to 4000# average cover tensile, 20 1/2" to 24 1/2" average friction pull. For the higher abrasion resistance applications and handling of materials where more strength is required to give greater belt life.

Width	Ply	List Price	Sale Price
18"	4	\$5.67 foot	\$4.20 foot
20"	4	6.22 foot	4.61 foot
24"	4	7.32 foot	5.41 foot
24"	5	8.53 foot	6.31 foot

Other widths, plies, duck weights and cover thicknesses available at low prices. Write for Free Sample.

NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE



3-roll, 5" diameter Troughing Idlers for:	
14" belt	\$18.50
16" belt	19.25
18" belt	20.50
20" belt	20.75

1-roll, 5" diameter Return Idlers for:	
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16" belt	7.50
18" belt	8.00
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All steel. Interchangeable with other well-known makes. Furnished with easily replaceable pre-lubricated Sealed ball bearings. Also can be furnished with greaseable type Alenite Fitted bearings at slight additional cost. Maintenance is negligible. Bonded Rubber Disc Impact Idlers priced from \$61.00. Write for Bulletin #1138.

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- New 10 x 24 Roller Bearing Jaw Crusher
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8" screw, double disc; 125 HP 440 motor; handles 400 bbl per hr. In excellent condition.

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Rotary, model C.250; 1410 cfm, 20 psi. Unused, less power.

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- 1 Motor, electric 40/20/27 H.P. Allis-Chalmers, three speed, 1740/870/1150 R.P.M. open type, 3 phase, 60 cycle, 440 volt.
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- 2 Locomotives, 8 and 12 ton, 36" gauge Plymouth.
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8' x 125' x 3/4"

7' x 50' x 1/2"

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20" x 12" Jeffrey Hammer Style A, NEW

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Cedarapids 1836 twin jaw crusher.
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27 1/2' ton, single-compartment 8'x12' bin.
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Special bins to your specifications.
Conveyors—18" 24" 30"—36". Also conveyor testing.

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Lorain L50K, 6 1/2-yard diesel crane-shovel.
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Lorain L-40, 1/2-yard diesel clam-drag shovel.
Lorain TL-20 diesel powered backhoe.
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1. Euclid Model 3 HV loader.
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1. Caterpillar D7W 10 with Athey side dump.
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1. Austin Western diesel powered grader.
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Lorain 820, 2-yd, 23' boom, 21" stick.
Lorain 41, 1 yd, 21' boom, 17" stick.
Lorain 40, 1/2 yd, 19' boom, 16" stick.
Lorain 30A, 1/2 yd, 16' boom, 13-4" stick.
Good 903, 2 yd, 24' boom, 20-6" stick.

BACKHOE ATTACHMENTS

Lorain 30, 19' boom, 7' stick, 48" bucket.
Lorain 40A, 18' boom, 7' stick, 28", 36" or 44" bucket.
Lorain 15, 14' boom, 5' stick, 24" bucket.
Kochling 304, 19' 10" boom, 5-6" stick, 38" bucket.

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Cat D7700, 74 HP at 1000 RPM. Rebuilt.
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GMC Twin Diesel, rebuilt.
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Barber-Greene 848 Model with drier, gradation unit, etc.

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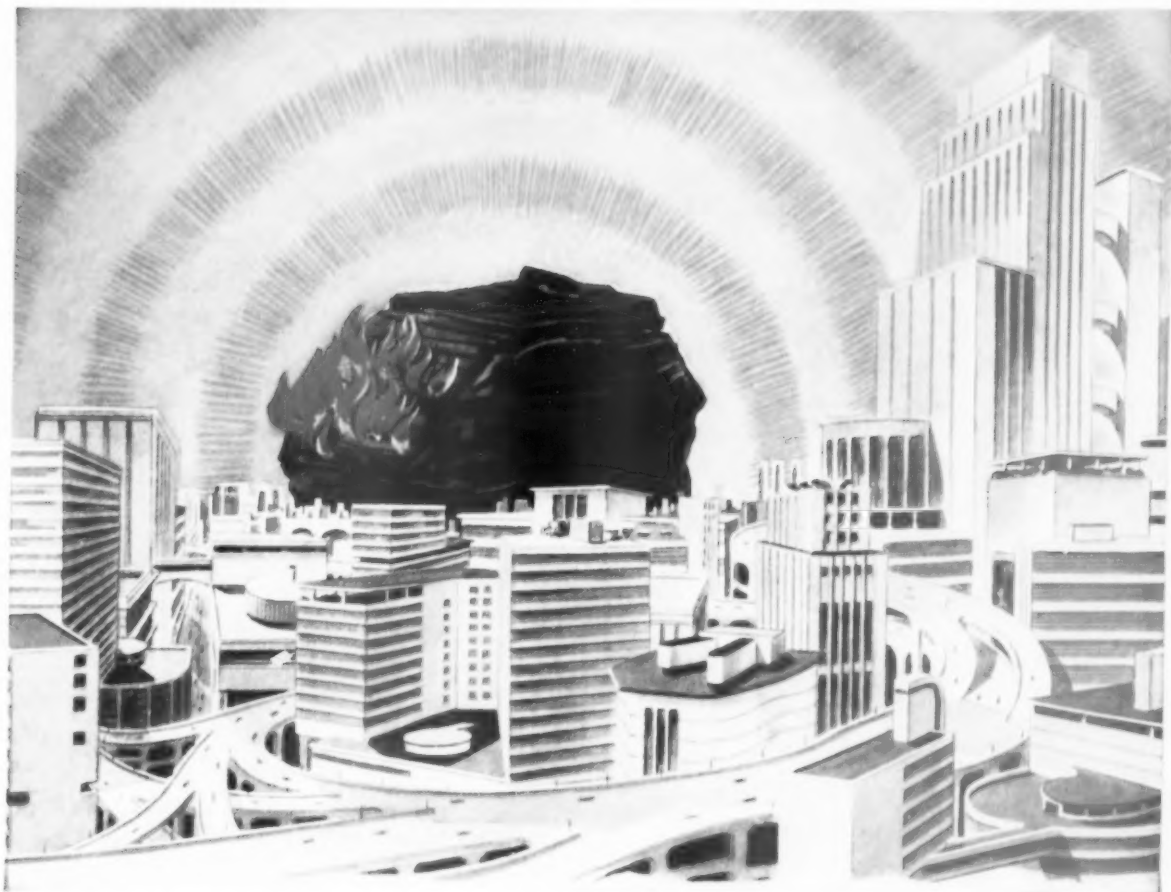
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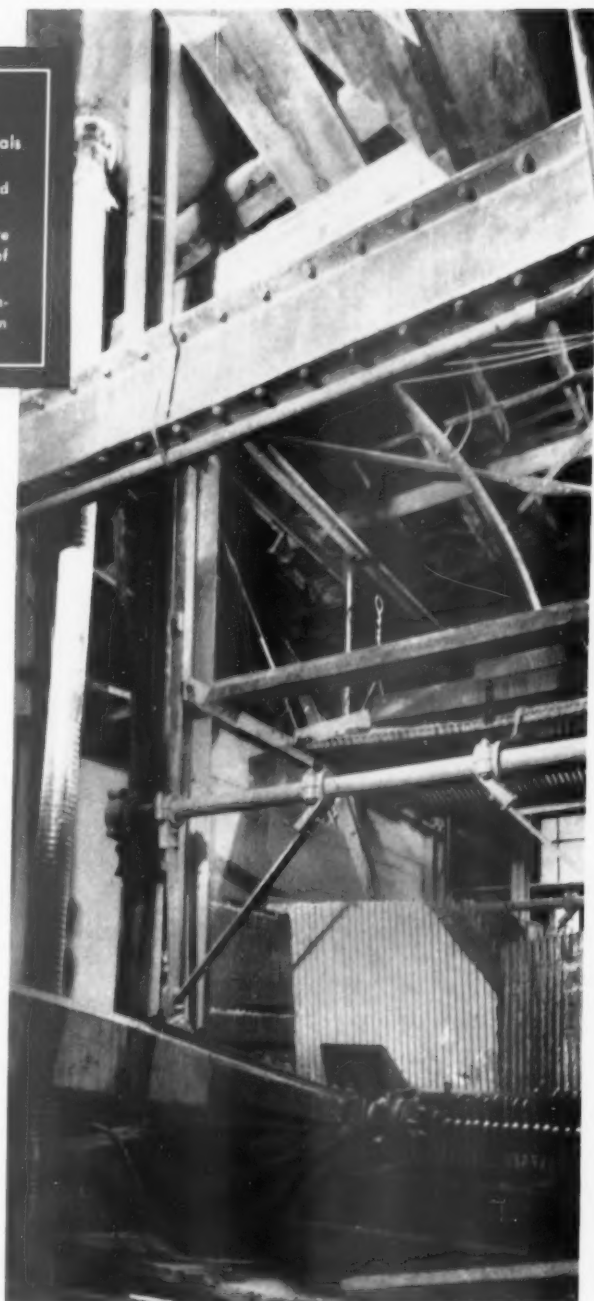


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